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REPORT ON TRAINING NEEDS ASSESSMENT FOR THE WESTERN INDIAN OCEAN REGION

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Training Needs Assessment for the Western Indian Ocean Region

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An assessment study undertaken by WIOMSA on behalf of the UNEP-GEF WIO-LaB Project entitled 'Addressing land-based activities in the Western Indian Ocean Region'

Report prepared

by

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LIST OF ABBREVIATIONS AND ACRONYMS

AASA	Aquaculture Association of South Africa
ASCLME	Agulhas and Somali Current Large Marine Ecosystem
AUPELF/UREF	Association des Universités Partiellement ou Entièrement de Langue Française
COI	Commission de l'Océan Indien (Indian Ocean Commission)
CRC	Communications Research Center
CSIR	Council for Scientific and Industrial Research
CRTR	Coral Reef Targeted Research and Capacity Building for Management
CZMC	Coastal Zone Management Centre
ERB	Engineers Registration Board
FAO	Food and Agricultural Organization
GEF	Global Environment Facility
GIS	Geographic Information System
GPA	UNEP Global Programme of Action for the Protection of Marine Environment from Land-based Activities
IAEA-MESL	International Atomic Energy Agency -Marine Environment Studies Laboratory
ICM	Integrated Coastal Management
InWEnt	Internationale Weiterbildung und Entwicklung (Capacity Building International, Germany)
IMO	International Maritime Organization
IMS	Institute of Marine Sciences
IOC	International Oceanographic Commission of UNESCO
IOI-SA	International Ocean Institute-South Africa
IUCN	International Union for the Conservation of Nature
JKUAT	Jomo Kenyatta University of Agriculture and Technology
KIE	Kenya Institute of Education
KIFWA	Kenya International Freight and Warehousing Association
KMFRI	Kenya Marine and Fisheries Research Institute
LBA	Land-Based Activities
MCEN	Marine and Coastal Educators Network
MIEM	Masters of Integrated Environmental Management
MPA	Marine Protected Area
MWW	Municipal Waste Water Management
NEMC	National Environment Management Council
NEPAD	New Partnership for Africa's Development
NGO	Non Governmental Organization
NPA	National Action Programme
OSMAG	Oil Spill Mutual Assistance Group
PADH	Physical Alteration and Destruction of Habitats
PAP	Personal Action Plans
PEMSEA	Partnership in Environmental Management for the Seas of East Asia
PMU	Project Management Unit of the WIO-LaB Project
ReCoMaP	Regional Programme for the Sustainable Management of Coastal Zones of the Countries in the Indian Ocean
RAC	Regional Activity Center

RRL	Regional Reference Laboratory
SEACAM	Secretariat for Eastern African Coastal Area Management
SADC-REEP	South African Development Community Regional Environmental Education Programme
SAP	Strategic Action Plan
SUCCESS	Sustainable Coastal Communities and Ecosystems Program
SWIOFP	South West Indian Ocean Fisheries Project
TDA	Transboundary Diagnostic Analysis
UCLAS	University College of Lands and Architectural Studies, Tanzania
UN	United Nations
UN/DOALOS	United Nations/Division of Ocean Affairs and Law of the Sea.
UNEP	United Nations Environment Programme
UNOPS	United Nations Office for Project Services
UNESCO-IHE	Institute for Water Education
UN-HABITAT	United Nations Human Settlements Programme
WIOMSA	Western Indian Ocean Marine Science Association
WIO	Western Indian Ocean
WTO	World Tourism Organization
WWF	World Wide Fund for Nature
WWF-EAME	World Wide Fund for Nature - East African Marine EcoRegion

EXECUTIVE SUMMARY

The UNEP-GEF WIO-LaB Project commissioned the Western Indian Ocean Marine Science Association (WIOMSA) to undertake an assessment of training needs in some of the countries that are participating in the implementation of the project, namely Comoros, Kenya, Madagascar, Mauritius, Seychelles, South Africa and Tanzania. The assessment was conducted in relation to key thematic areas of the WIO-LaB Project that include Physical Alteration and Destruction of Habitats (PADH), Municipal Waste Water Management (MWWM) and Legal and Technical review. The areas form the focus of the WIO-LaB Project activities concerning the impacts of land based activities on coastal and marine environment in the Western Indian Ocean (WIO) region.

The UNEP-GEF WIO-LaB project which is implemented within the auspices of the UNEP/Nairobi Convention for the protection, management and development of the coastal and marine environment in the Eastern Africa region, aims at achieving its three major objectives, namely to (1) reduce stress to the ecosystem by improving water and sediment quality, (2) strengthen the regional legal basis for preventing land-based sources of pollution and (3) develop regional capacity and strengthen institutions for sustainable, less polluting development. It is within the context of the third objective of *….developing regional capacity….* that the WIO-LaB Project requested WIOMSA to undertake this training needs assessment with the aim of developing a Regional Training Programme that will lead to: (i) development of the capacity required for the effective implementation of the various WIO-LaB Project activities and (ii) increase the capacity of stakeholders (and in particular, government institutions) in the WIO region to effectively manage and control the impacts of land-based activities on the coastal and marine environment.

The needs assessment was undertaken using mainly questionnaire surveys targeting key stakeholders involved in education and training activities, including also the key decision makers, senior administrators, the private sector and community groups. The aim of the survey was to assess the scope of knowledge of different stakeholders with regard to impacts of land based activities on the coastal and marine ecosystems, placing more emphasis on the key sectors that include tourism, aquaculture, ports and harbors, coastal mining, municipal waste water management, solid waste management and agriculture, etc.

The administration of questionnaires in some of the participating countries was facilitated by National Focal Points of the UNEP/Nairobi Convention who also act as the National Coordinators of various WIO-LaB Project activities in participating countries. Feedback was also received from individual experts in Kenya, Tanzania, Comoros, Seychelles, Madagascar, Mauritius and South Africa. The questionnaires covered various areas including the specialization of the individuals filling the questionnaires, information on the past training courses in the WIO region, skills in project management, professional and technical skills. Other aspects that were assessed included shortcomings of past training courses. The respondents also provided recommendations on training courses that should be considered by the WIO-LaB Project. Data and information received was analyzed on a country by country basis, and then merged to provide a regional outlook. Priority areas for training were selected based on the regional overview that emerged following analysis of data and

information contained in the national reports submitted by experts in the participating countries.

The findings of the questionnaire survey showed that there are several educational institutions (i.e. universities and colleges) offering training courses that are of relevance to the key areas of focus for WIO-LaB project. Additionally, various short term capacity building/training activities have been held in the WIO region focusing mainly on different subjects ranging from broad topics such as Integrated Coastal Management (ICM) and Marine Protected Areas (MPA) management to very specialized training courses such as on the control of oil spills.

Inadequate technical expertise on some important aspects was recognized in this assessment as an issue of concern. The technical areas where capacity is inadequate includes the following; (i) rehabilitation of degraded mangrove forests, (ii) use of Geographic Information Systems (GIS) for modeling and management purposes, (iii) selection of appropriate mariculture sites and good practices in aquaculture, (iv) socio-economic assessments of households and livelihood strategies, (v) property rights and the use of local knowledge for management purposes, (vi) understanding of the basic guidelines for urban and rural planning and use of planning tools, (vii) understanding of development processes, adoption and enforcement of laws and policies, (ix) understanding of environmental impacts of coastal tourism and different tools for the assessment of the impacts of tourism on environmental and coastal communities.

There is need for WIO-LaB Project to ensure that the training programmes that are developed are able to impart hands-on technical skills (to a group of trainees) that can be passed on to other persons within the society. Emphasis needs to be placed on staff exchanges to demonstration projects so that lessons learnt in one demonstration project could be disseminated as widely as possible. Findings of the study also showed the need for courses to be short (one to two weeks) as participants are able to be away from work for short durations of time.

Post training course activities that ensure continuous interactions between various trainees following their participation in a targeted training course need also to be promoted. Such post training activities provide an opportunity for the trainees to provide their feedback on the usefulness of the various training courses. In this regard, also, it would be important to come up with indicators of progress/success to gauge the applicability of knowledge gained in a specific training course.

This assessment report proposes a comprehensive training programme to be implemented under the auspices of the WIO-LaB project, with involvement of national, regional and international partners. The proposed training programme consists of one general course namely "Training course on Integrated Coastal Management (ICM) with emphasis on Physical Alterations and Destruction of Habitats and Municipal Waste Water Management (PADH/MWWM)" and six specialized training courses. The general course on ICM with emphasis on PADH/MWWM will aim at providing basic knowledge on PADH and MWWM issues targeting key decision makers and senior administrators in government institutions. Based on the existing priorities, this course could be organized jointly by Nairobi Convention/WIO-LaB Project in collaboration with the Regional Programme

for the Sustainable Management of Coastal Zones of the Countries in the Indian Ocean (ReCoMaP) and WIOMSA. For the specialized courses, the following courses are proposed (in bracket are the organizations that are proposed to take a leading role in planning these courses): "Sediment and Water Quality Monitoring and Analysis (*WIO-LaB in collaboration with IAEA-MESL*)"; "Management of Municipal Waste Water (*WIO-LaB and UNEP/GPA*)"; "Constructed Wetlands as Waste Water Treatment Plants (*WIO-LaB and PUMPSEA Project*)" and "Habitat Rehabilitation/Restoration (*WIO-LaB in collaboration with KMFRI (mangroves), Nature Seychelles (small islands) and CRTR project (coral reefs))*". Two other courses recommended were: "Leadership: Leading with impact (*Nairobi Convention Secretariat and IOC-UNESCO*)" and "strategic planning with a focus on the process for the formulation/development of TDA/SAP for the Western Indian Ocean region (*WIO-LaB*)".

1.0 BACKGROUND

The United Nations Environment Programme (UNEP) in collaboration with the countries of the Western Indian Ocean (WIO) region (Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, South Africa and Tanzania) are involved in the implementation of the WIO-LaB Project entitled "Addressing Land-based Activities in the Western Indian Ocean". The project is financed by the Global Environment Facility (GEF) and the Norwegian Government and is implemented within the auspices of the UNEP/Nairobi Convention for the protection, management and development of the coastal and marine environment in Eastern Africa. The main objectives of the project are:

1) Reduce stress to the ecosystem by improving water and sediment quality;
2) Strengthen regional legal basis for preventing land-based sources of pollution, and;
3) Develop regional capacity and strengthen institutions for sustainable, less polluting development.

The project also serves as a demonstration project for the UNEP Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (GPA) based in the Hague, the Netherlands. Within the context of its third objective, the WIO-LaB Project sub-contracted the Western Indian Ocean Marine Science Association (WIOMSA) to undertake an assessment study on the training and education needs in the WIO Region, in relation to its activities and objectives of the WIO-LaB Project. The Terms of Reference for this exercise are presented in Annex 1 of this report.

The overall aim of this needs assessment was to generate information that would lead to the development of appropriate and relevant training programmes that emphasize (i) the development of the capacity required to effectively implement the various WIO-LaB Project activities and (ii) increase the capacity of stakeholders in the WIO region to effectively manage and control the impacts of land-based activities on the coastal and marine environment. Despite the fact that a number of training needs assessments for capacity building for different aspects such as Marine Protected Areas (MPA) management and Integrated Coastal Management (ICM) have been conducted in the WIO Region in the past, so far no training needs assessments have been conducted with regard to the key focal areas of the WIO-LaB Project. Some of the organizations that have conducted needs assessments include WIOMSA and CRC for ICM (Kiambo, et al. 2001) and WIOMSA and CZMC for the MPA management (Francis, et al 1999).

This assessment was carried out by WIOMSA in the period between November 2005 and August 2006. The assessment evaluated skills and expertise in areas of project management, professional and technical skills in Kenya, Tanzania, Comoros, Seychelles, Madagascar, Mauritius and South Africa (Figure 1). Areas where capacity building is required were documented as well as weaknesses of past training courses. Based on the findings of the assessment, several appropriate training courses (including modes of delivery) were recommended. Numerous training needs were identified. However, the assessment exercise targeted only those that emerged as priority needs with a special focus on training courses that are consistent with the

WIO-LaB Project objectives and/or activities. The overall aim of the assessment was to establish training curricula using existing capacity and courses wherever possible.

The WIO-LaB Project is implementing a number of capacity building activities with emphasis on the management of land based activities that may have impacts on the coastal and marine environment. Through this needs assessment, a training programme for stakeholders (including decision makers, senior administrators, technical experts, researchers and communities), in the region was developed. More specifically this assessment formed the basis of the development of specific tailor made courses for the region for implementation by the WIO-LaB Project training programme.

This report which is divided into six sections also provides an overview of the previous capacity building initiatives in the WIO Region. It also provides insights into the outcomes of past training needs assessments as well as training activities conducted in the region in the period 2000 – 2005. Results of this training needs assessment are provided for each of the participating countries, namely Comoros, Kenya, Madagascar, Mauritius, Seychelles, South Africa and Tanzania. The training needs from these individual countries were summarized in order to provide a regional overview of the training needs within the WIO Region. The Report also provides a number of recommendations on specific training courses that will assist in strengthening the knowledge and expertise for sound management of land based activities within the WIO region.



Figure 1: Map of the WIO region

2.0 PREVIOUS CAPACITY BUILDING INITIATIVES

Capacity building initiatives have taken different forms in the WIO region ranging from short-courses (typically 1-2 weeks) to long-term training courses offered by Universities and Colleges mainly for academic diplomas and degrees.

2.1 Past needs assessments and training courses conducted in the WIO region

There have been several capacity needs assessments that have been conducted in the WIO Region in the past. The results of those previous assessments are partly relevant to the WIO-LaB Project themes and sectors of concern. An assessment of capacity related to Integrated Coastal Management (ICM) was conducted from January to September 2000 (Kiambo, et al. 2001). Three tools to build human capacity were recommended in this assessment, namely; learning by doing, information exchange and development of a formal curriculum that incorporates material relevant to coastal management. Furthermore, the assessment recommended five cross cutting areas as priority areas for training. These were: (i) project and ecosystems evaluation and monitoring; (ii) integration of sectors; communication; (iii) community participation and valuation of resources.

One of the main outcomes of this assessment was the training course entitled '*Learning & Performing: Developing Skills for Coastal Management Practitioners'*. This course was one of its kind in the WIO region in the sense that it was designed to provide participants with a hands-on experience on projects/program management as well as enhancement of ICM practice and professional skills (Coley et al. 2002). The main goal of this program was to strengthen participant performance and leadership qualities. Specific objectives included building a critical mass of capable coastal management practitioners who can catalyze ICM in their home countries and lead the region into the future; learn and share their emerging coastal management experiences in the WIO region; present key components of ICM (why they are important and how they can be applied); and increase participant project management and professional skills.

There were four Modules that were delivered in the period between March and October 2001; each module was delivered for one week at different WIO locations. Module 1 was delivered from 18th to 24th March 2001, in Zanzibar, Tanzania, while Module 2 took place from 6th to 11th May 2001 in Malindi, Kenya. Module 3 took place between 2nd and 8th August, in Antananarivo, Madagascar. Finally, Module 4 was delivered in October 2001, in Tanga, Tanzania. In total, 18 participants drawn from Comoros, Kenya, Madagascar Mozambique and Tanzania attended the training course. One of the key elements of the course was the development of project proposals during the course which were evaluated during the last Module and implemented after the completion of the training.

Capacity needs in the area of wastewater management in the WIO region was assessed in Tanzania in 2003 by UNEP/GPA in collaboration with the UNESCO-IHE Institute for Water Education and WIOMSA. This assessment aimed at determining the skills, knowledge and attitudes of personnel involved in wastewater management. Basics of wastewater management and the implications of discharge into the marine environment, aspects of wastewater plant design, monitoring, quality control and

implementation of pollution penalties were some of the recommended areas for training that emerged from this assessment. The assessment was used as one of the basis for developing the training manual as well as designing courses on municipal wastewater management that were held in Zanzibar (2003); Dar es Salaam (2003) and Cape Town (2004).

WIOMSA in collaboration with its partners has also organized three regional training courses for MPA managers. These courses were designed for the senior MPA management staff in the region, as well as professionals from key institutions and programmes that are involved in MPA management. The courses lasted for two weeks and included modules covering aspects such as marine environment and protected areas; MPA planning; MPA operations; participatory processes; communication and public relations; sustainable utilization and alternatives; and monitoring and evaluation (including assessment of management effectiveness).

A series of training courses on specific issues were conducted by the Secretariat for Eastern African Coastal Area Management (SEACAM) that was based in Maputo, Mozambique. The course was attended by a range of participants from the WIO region. As with the MPA managers course, the SEACAM Training courses were combined with the preparation of a publication reflecting the content of the course. Courses that were delivered included environmental assessment of tourism (Grange and Odendaal, 1999) and aquaculture in the coastal environment (Hambrey et al; 2000), and project design and management (SEACAM, 1999) (Appendix 1).

Various other capacity building courses have also been undertaken in the WIO region, as listed in Table 1. In addition, there are other training courses and workshops that were mentioned in the questionnaire survey of this training needs assessment as well as by other sources.

Table 1: List of some of training courses and workshops conducted in the region from 2000 to 2005 that dealt with priority areas of the WIO-LaB project

MAIN TOPICS COVERED	TYPE COURSE/ WORKSHOP	ORGANIZER	VENUE	YEAR
1. Coastal Management Leadership (Public Sector Management)	Course	SEACAM	South Africa Seychelles	1999 & 2000
2. Kenya Marine Resources Utilization and Surveillance	Workshop	Stakeholders	Kenya	2000
3. Mining and the environment	Workshop	ERB, Tanzania	Tanzania	2000
4. Municipal Wastewater	Workshop	UNEP, GPA, NEMC, WIOMSA	Tanzania Kenya	2001 & 2003
5. Studies on the Environmental Impacts on Coastal areas	Training	AUPELF/UREF	Madagascar	2001
6. Environmental	Workshop	SEACAM/CSIR	South Africa	2002

MAIN TOPICS COVERED	TYPE COURSE/ WORKSHOP	ORGANIZER	VENUE	YEAR
Assessment of Coastal Mining				
7. Teachers Training on Environmental Education	Course (1-5 days)	ProZim & Partners	Kenya	Annually 2003-2005
8. Project Planning	Course	ADB	Seychelles	1996-2002
9. Planning Sustainable Tourism	Course	WIOMSA	Zanzibar,	2003
10. Water for African Cities	Workshop	UN-HABITAT	Ethiopia	2003
11. Aquaculture	Training	KMFRI	Kenya	2004
12. Agriculture (Sustainable farming)	Course (1-5 days)	BOABAB TRUST	Kenya	2004
13. Marine pollution, Prevention and Environmental Management in Ports	Workshop	IMO, UNEP, NEPAD	Kenya	2004
14. Management of Ports in East Africa	Workshop	PEMSEA	Kenya	2004
15. Use of Wetlands for water quality	Seminar	UNESCO-IHE	Uganda	2004
16. Shoreline changes	Meeting	WIOMSA	Zanzibar	2004
17. Coastal Aquaculture Development	Training	NEMC	Tanzania	
18. Improving Municipal Wastewater Management in Coastal Cities	Short course (1 week)	IOI-SA, in conjunction with UNEP-GPA, UNESCO-IHE, UN/DOALOS Train-Sea-Coast	South Africa	2004
19. EIA of Coastal Tourism Development	Training	NEMC	Tanzania	
20. Coastal Processes & Legislation	Workshop	Dept of Environmental Affairs & Tourism	South Africa	2004
21. Coastal Management	Training	Marine and Coastal Management, Department of Environmental Affairs and Tourism	South Africa	2004
22. Africa Environmental Outlook	Workshop	UNEP	Kenya	2004
23. Sustainable Coastal Tourism	Workshop	WTO, NEPAD	Kenya	2005
24. Aquaculture	Workshop	KWETU	Kenya	2005
25. Dredging in Ports and Harbours	Workshop	OSMAG	Kenya	2005
26. Oil spills	Workshop	OSMAG	Kenya	2005
27. Managing Marine Pollution	Short course (2 weeks)	IOI-SA, in conjunction with UN/DOALOS Train-Sea-Coast	South Africa	2005

MAIN TOPICS COVERED	TYPE COURSE/ WORKSHOP	ORGANIZER	VENUE	YEAR
28. Careers in the Marine Environment(school -based)		African Coelecanth Ecosystem Programme	South Africa	2005
29. Orientation to Marine Environment		African Coelecanth Ecosystem Programme	South Africa	2005
30. Overview of aquaculture and Commercial aquaculture	Training course		South Africa	2005
31. Sustainable livelihoods (SL) Approaches and Monitoring for Coastal Resources livelihoods in South Africa	Training course	The IDL group & Department of Environmental Affairs and Tourism	South Africa	2005
32. Environmental Impact 33. Assessments	Training course	Rhodes University	South Africa	2005
34. 7th bi-annual International Conference on Aquaculture: Unlocking the potential	Workshop	Aquaculture Association of South Africa (AASA)	South Africa	2005
35. Preparing Blue Flag Beaches Staff	Workshop	Two Oceans Aquarium	South Africa	2005
36. Resolving Coastal Conflicts in an intercultural context.	Training	InWEnt	Mozambique	2005
37. How to implement Community based Coastal Zone Management successfully	Training	InWEnt	Namibia	2005
38. Waste Management in Urban Settings in East Africa	Workshop	Embassy of France/URIFRANCE	Kenya	2005
39. Mariculture Extension	Training	SUCCESS/WIOMSA	Tanzania	2005
40. Ecological Modelling	Course	University of Dar-es-Salaam	Tanzania	Annually
41. Biodiversity studies for Ecoregions	Short Courses	WWF	Various countries	Periodic

2.2 Existing University and College Training Programmes

Universities and colleges in the region offer long term training and impart background knowledge that may then be built upon by short term training and hands-on activities

recommended by this training assessment. Table 2 provides a list of long term training conducted by universities and colleges in the region.

Table 2: List of existing organizations/colleges/universities that offer regular training topics related to priority areas of the WIO-LaB project in the participating countries

INSTITUTION	FACULTY/DEPARTMENT	TOPICS/SUBJECTS
KENYA		
Catholic University of Eastern Africa	Departments of Biology, Geography and Education	Marine Biology. Environmental Education & Environmental Studies
Egerton University	Faculty of Agriculture Faculty of Engineering & Technology	Agriculture, Aquatic Sciences
Maseno University	Faculty of Environment and Natural Resource Management Department of Geography	Water & Environmental Engineering, Natural Resource management
Moi University	School of Natural Resources Management, School of Economics and Business Management School of Environmental Studies	Fisheries & Forestry Tourism Management Environmental Studies (Oceanography, Geology, Water Resources, etc)
Nairobi University	College of Biological and Physical Sciences College of Agriculture and Veterinary Medicine Department of Geography	Agriculture, Biological Sciences (Zoology, Botany), Geology, Hydrology, Meteorology, Geography, Environmental Management and Planning.
Kenyatta University	School of Environmental Studies and Health Sciences Department of Geography	Environmental Science, Environmental Planning, Environmental Management, etc Geography, Hydrology, Watershed Management
Jomo Kenyatta University of Agriculture and Technology	Faculty of Agriculture Faculty of Science	Agricultural Engineering & Technology, Biological Sciences (Zoology, Botany)
Kenya Wildlife Service	Kenya Wildlife Service Training Institute	Wetland conservation Environmental Management Eco-Tourism Fisheries & Aquaculture
Middle level colleges Polytechnics, Kenya Science Teachers College	Departments of Environmental Studies (Diploma courses)	Environmental Sciences
United States International University,	Tourism & Hotels	Tourism Management
Kenya Utalii College	Tourism & Hotels	Tourism management
Bandari College	Courses in Port Operations, (limited to employees of Kenya Ports Authority)	Management of cargo Coxwain courses
Bandari College	Courses offered in conjunction with Jomo Kenyatta University of Agriculture and Technology (JKUAT) & Kenya International Freight and Warehousing Association (KIFWA) and KIE	Certificate & Diploma courses in Information technology, Diploma in Freight management Certificate in Maritime studies, Diploma in shipping (offered to members of the public)
Kwetu Training Centre		Hands on training in Aquaculture & Mariculture

INSTITUTION	FACULTY/DEPARTMENT	TOPICS/SUBJECTS
TANZANIA		
University of Dar-es-Salaam	Faculty of Aquatic Science and Technology	Aquaculture
	Faculty of Arts and Social Sciences Department of Geography	▪ Tourism and Leisure Environmental Policy and Planning
	Faculty of Science (in collaboration with the College of Engineering) Masters of Integrated Environmental Management (MIEM)	▪ Pollution Prevention and Control ▪ Environmental Impact Assessment ▪ Biological Wastewater Treatment Fundamentals of Anaerobic Digestion Processes
	College of Engineering Postgraduate Diploma in Environmental Engineering	▪ Solid Waste Management ▪ Water Pollution Prevention and Control Operation in Wastewater Treatment
	University College of Lands and Architectural Studies (UCLAS) Faculty of Lands and Environmental Engineering	▪ Wastewater Treatment Technology Solid Waste Management and Technology
	Institute of Marine Sciences	Marine Pollution
Sokoine University of Agriculture	Faculty of Science	Environmental Sciences and Management
National College of Tourism		Tourism & Hotel management
Dar-es-Salaam Maritime Institute	Department of Marine Engineering, Department of Maritime Transportation	Sea Transportation, Ports and Harbors
SOUTH AFRICA		
University of Fort Hare	Faculty of Science and Agriculture/Zoology	Aquaculture, Aquatic biology/Ecology/ Fisheries
University of Kwazulu-Natal	Faculty of Science and Agriculture/Geography	Marine biology Coastal Management
University of Cape Town	Biological Sciences	Marine sciences Oceanography
Venda University of Science and Technology	Environmental sciences/Zoology	Rural-based environmental Studies/Aquatic ecology
University of the North	Faculty of Science	Aquaculture/Aquatic ecology
Nelson Mandela Metropolitan University (formerly University of Port Elizabeth)	Departments of Zoology and Botany	Marine science
Stellenbosch university	Aquaculture Division Genetics Department	Aquaculture
University of Limpopo	Aquaculture Research Institute	Aquaculture
Rhodes University	Dept. Environmental Science	Environmental management Community based natural Resource management

INSTITUTION	FACULTY/DEPARTMENT	TOPICS/SUBJECTS
Two Oceans Aquarium	Environmental Education Centre	Mariculture, Marine invertebrates & Vertebrates, Water conservation, Marine alien invaders
SEYCHELLES		
Seychelles Hospitality Tourism Training Centre	-	Tourism related courses
Maritime Training Centre	-	Navigation, Marine Safety, Marine Environment & Pollution, Fisheries Science
MAURITIUS		
University of Mauritius	Faculty of Science	Agriculture, Biology, Oceanography, Environmental Management, Environmental Toxicology and monitoring
University of Technology	Social Sciences	Tourism
Ecole Hoteliere		Hotel Management
MADAGASCAR		
University of Tulear	Institute of Marine Sciences.	Aquaculture, Marine resources, Biology
COMOROS		
University of Comoros	Faculty of Science and Technology	Environment management

2.3 Other forms of capacity building

Capacity building initiatives in the WIO region have also involved the development and dissemination of training materials and tools. Practitioners in the region have often complained about the difficulties they face accessing information and guidance on different issues related to their day-to-day operations. Various materials and tools have been produced through different initiatives. These include: MPA manual (Francis, et al., 2002); MPA Toolkit (IUCN, 2004); Guidelines on economic tools for MPA management (Emerton, 1999); Improving municipal wastewater management in coastal cities (UNESCO-IHE and UNEP/GPA, 2004) as well as SEACAM guidelines on coastal tourism (Grange and Odendaal, 1999), aquaculture (Hambrey, et al., 2000) and coastal mining (CSIR, 2003).

These materials and tools have been disseminated through different mechanisms including organization of workshops specifically designed to introduce this material to the relevant practitioners.

Some of these materials have been used as the main background publication in some of the regional training courses. For instance, "MPA Manual" and "MPA Toolkit" were used in the Regional Training Courses in MPA Management in Eastern Africa, while "Improving municipal wastewater management in coastal cities" was used in courses conducted in a number of municipalities in the region including Zanzibar, Dar es Salaam, Cape Town and Maputo.

2.4 Post courses activities

Nine months after the completion of the *Learning and Performing Course*, WIOMSA in collaboration with CRC conducted a post-course evaluation. The aims of the evaluation were twofold; (i) assess how the skills and knowledge acquired during the course have been used in the field and (ii) gather information that may help to improve the course content and mode of delivery of the future courses (WIOMSA/CRC 2002).

During the Second and the Third Regional Training Course in MPA management, participants were asked to prepare *Personal Action Plans* **(**PAP**).** PAP is a simple tool designed to help participants to reflect on new ideas, concepts and skills accumulated during the course and apply the newly acquired skills in their work situation. The objectives of the PAP are to: (i) improve the use of the information, ideas and methods discussed in this course in work situations; (ii) serve as an aid in the planning of future activities and (iii) assist practitioners to make a meaningful and effective evaluation of the course and thus provide the organisers information to improve the content, approach and delivery of the course.

Other post course activities included the setting up of a list-server for the *Learning and Performing* alumni and establishment of the WIO-MPA Newsletter by the participants of the Third Regional Training Course in MPA management.

One of the main challenges of the post course activities is their long-term sustainability. For various reasons, most of these activities did not last beyond one year of the course. Limited resources and capacity to maintain these on both the organizers side and the participants were some of the reasons that contributed to early collapse of these activities.

2.5 Summary of Previous capacity building initiatives

In summary, the previous capacity building initiatives and training courses listed in Tables 1 and 2, drawn from the responses of the respondents, reflect the diverse capacity building activities conducted in the region over the years and indicate the existence of general understanding and knowledge in coastal issues. These training courses, workshops and tertiary level courses listed indicate that there has been a broad spectrum of both short and long term courses that cover different aspects that are relevant to the WIO-LaB project (such as tourism, aquaculture, agriculture, environmental education, pollution and municipal waste water management, port management, solid waste management and shoreline changes). However, courses on aspects of coastal mining were few. It is also clear that the courses were organized by regional and international organizations based on their priorities and projects at the time. In this regard, only a few of the courses have been repeated or replicated. Additionally, post course evaluations to determine if these courses were effective in imparting skills and knowledge have also been few. The courses also do not appear to be linked to recognized institutions for accreditation and certification purposes.

Formal education programmes offered by universities and colleges have limitations in that participants have to meet set qualifications. For instance, an arts student may not qualify to undertake a course in fisheries biology. Additionally, there is an age

discrimination which may not be the case with short courses. Therefore, participants of short courses benefit from the fact that they are able to learn from other participants who have diverse backgrounds as there is an integration of varied expertise and working experience.

3.0 METHODOLOGY

While acknowledging the existence of strong education facilities and past and ongoing training courses, the WIO-LaB Project training needs assessment conducted by WIOMSA aimed at assessing emerging gaps in regional training that may hinder proper implementation and sustainability of WIO-LaB Project activities.

The needs assessment exercise was conducted by the use of questionnaires, which were, dispatched to the National Experts identified by WIOMSA in collaboration, in some cases, with the Focal Points of the Nairobi Convention. The National Experts collected the information on training needs and dispatched the feedback to WIOMSA for compilation.

Documents from previously conducted training needs assessments on municipal wastewater management, water and sediment quality, legal aspects as well as leadership needs of the Nairobi Convention were also reviewed and used to input into the training programme. Additionally, comments and views of the respondents were also integrated into the training programme.

In addition to above, the assessment received input from members of the PADH and MWW Regional Task Forces during the joint regional meeting that was held in Moroni, Comoros, in the period 26th - 28th October 2005. Input was also received from the members of the WIO-LaB Project Steering Committee during its second meeting held in Diani, Kenya on 7th March 2006. Members of the Nairobi Convention Secretariat /WIO-LaB Project Management Unit also provided their inputs to the assessment.

The questionnaire for the evaluation of training needs comprised four-parts that focused on the following:

Part 1: General Information: This section was used to evaluate areas which the respondents were involved in the course of their work. Responses to questions on the general awareness of issues of concern within UNEP/GPA/WIO-LaB Project focal areas of tourism, aquaculture, ports and harbours, coastal mining, municipal wastewater and agriculture were evaluated. This section was also used to determine capacity building needs within the national, district, community and institutional level.

Part 2: Assessment of training needs on Land based activities: This section was used to evaluate project management skills, professional skills and technical skills. Respondents were requested to undertake a self evaluation indicating whether they considered themselves to be experts, skilled apprentices or beginners in various areas. The scores were averaged to indicate the area where respondents scored themselves highest. The areas evaluated in project management were leadership, management of meetings, fundraising, organizational skills, budgeting, supervising employees and

work planning. The areas evaluated in the section of professional skills were dispute resolution, facilitation, strategic planning, communication, fundraising, public education, science for management and demonstration activities. Technical skills evaluated were mangrove rehabilitation, Geographic Information systems (GIS), Mariculture, Social aspects, Planning, Legal aspects and sustainable coastal tourism. The level of skill in the different categories were evaluated on the basis of the understanding that an effective coastal manager should be proficient in project management, professional skills and have adequate technical knowledge to be effective in managing issues affecting the coastal environment.

Part 3: Assessment of training capacity on Land-based activities: Respondents were requested to provide a list of training courses and workshops that they have attended in the region as well as to provide a list of colleges and universities that provide training in topics related to the already identified WIO-LaB target sectors.

Part 4: Assessment of the preferred mode of delivery of training courses: Respondents were requested to provide information on strengths and weaknesses of past courses as well as to recommend modes of delivery.

The major limitation of this study is the small sample size based on number of people that responded to the questionnaire. A total of 88 respondents filled the questionnaire from Kenya, Tanzania, Comoros, Madagascar, Seychelles, Mauritius and South Africa. The time factor also served to limit the follow up period. However, from the responses provided it was clear that similar issues and concerns were raised in most of the WIO countries therefore making this assessment representative and reflective of the general needs in the WIO Region.

The information from each questionnaire was tallied into excel spreadsheets. Responses from each country were averaged to obtain an overview of perceptions from each country to the issues raised in the questionnaires. Further to this, the responses from each country were merged together to obtain the emerging priority areas for training focus.

4.0 EXISTING SKILLS AND TRAINING NEEDS IN THE PARTICIPATING COUNTRIES

4.1 Kenya

In Kenya, the respondents were professionals with experience that varied from marine affairs, forestry, environmental management, waste management, environmental chemistry, marine ecology and zoology, social ecology to financial administration. Some of the respondents were in lecturing positions as environmental educators, university lecturers and project managers. Sixty four percent (64%) of the respondents were involved in the tourism sector, 40% were dealing with solid waste management, 36% with agriculture, 28% in aquaculture and municipal wastewater management in their current work positions and 14% in the port and harbour sector. None of the respondents dealt with coastal mining in their current work positions. The awareness of issues of concern in the sectors targeted by the WIO- LaB project was evaluated and the results of this are shown in Table 3. The scope of awareness shows that

although the respondents were not involved directly in coastal mining or harbour and port activities during the course of their work they were still aware of issues of concern in these sectors.

Table 3: Environmental and management issues of concern in the different sectors targeted by the WIO-LaB project in Kenya
(The percentage values indicate the proportion of respondents that citied the issue as a concern; issues cited are those that scored 40% and above)

KEY SECTORS	KEY ISSUES IDENTIFIED IN THE DIFFERENT SECTORS OF CONCERN IN THE WIO LaB PROJECT IN KENYA
TOURISM	Coastal erosion and accretion (57%) Habitat destruction including mangroves (50%) User conflicts (50%) Pollution and related deterioration of water quality (43%)
AQUACULTURE	Habitat destruction including mangroves (50%)
PORTS & HARBOURS	Pollution and related deterioration of water quality (57%)
COASTAL MINING	Unsustainable resource extraction (50%)
MUNICIPAL WASTE WATER	Pollution and related deterioration of water quality (57%) Lack of institutional capacity for management of impacts (43%)
AGRICULTURE	Sediment runoff and related deterioration of water quality (57%) Coastal erosion and accretion (50%) Habitat destruction including mangroves (43%)

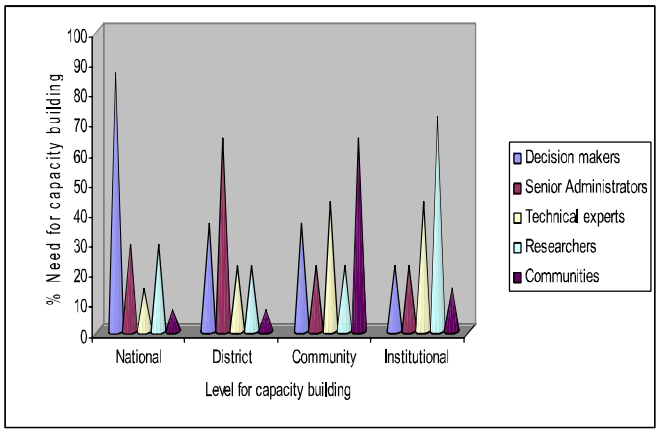


Figure 2: Levels at which capacity building is required in Kenya

Inadequate capacity has been identified as one of the main barriers to implementing measures to protect the marine environment from land based activities. The presence of capacity was evaluated at the national, district, community and institutional level and the different areas identified for capacity building are shown in Figure 2. At the national level, decision makers were identified as key group for capacity building at the district level senior administrative officials were identified. At the community level, the areas of capacity building were at the level of technical experts and the community while at the institutional level the need for capacity building was highest among the researchers.

Respondents felt that the presence of inadequate infrastructure limits intervention measures. It was also felt that inadequate research and technical capacity has resulted in inadequate information and data for sensitizing policy and decision makers as well as communities on marine environmental issues. Stakeholders were found to be unable to lobby effectively for their rights. In areas where legal action can be taken, ignorance allows for wrong practices to continue unabated. Legal frameworks,

institutional capacity and political will were cited as being important in implementation of changes. The integrated coastal zone management framework was considered to be important in enhancing inter-agency collaboration.

Areas of expertise and skills in project/programme management, professional and technical skills were evaluated based on the respondent's opinions of their skills. The highest score (76%) was obtained in the area of project management, followed by professional skills (70%) and technical skills (57%). In the area of project management priority areas identified for training were fundraising and leadership (Table 4). In the area of professional skills, strategic planning and dispute resolution were the key areas cited for training (Table 4). In the assessment of technical skills, areas that were identified for more training are GIS, Legal aspects and Planning (Table 4).

The greatest strengths of the training courses offered in the past as well as presently were cited to be the fact that the courses have been based on identified needs (50% of the respondents cited this to be true), the applicability of the knowledge imparted (43%) and quality of the trainers (36%). The greatest weakness of the courses was cited as the lack of post training course activities (36%). Some respondents also felt that appropriateness of the target groups and applicability of the course knowledge was a weakness (21% of the respondents cited this in both cases).

Table 4: Priority areas for training in each category in Kenya
(The percentage of respondents that identified the priority areas is shown in brackets)

PROJECT MANAGEMENT	**PROFESSIONAL SKILLS**	**TECHNICAL SKILLS**
Fundraising (43%) Leadership (36%)	Strategic planning (50%) Dispute resolution (29%)	Geographic Information Systems (57%) Legal aspects (36%) Planning (29%)

Short courses on specialized technical subjects were the most attractive with 71% of the respondents selecting this as the most preferred mode of course delivery. Short courses on general management were also preferred (57%). In-service courses were selected by 50% of the respondents and 50% selected formal certificates. The recommendations made by the respondents targeted specialized technical subjects (50%) with emphasis on staff exchanges and study tours to demonstration projects (43% of the respondents cited these in both cases).

Organizations usually hire trained people with basic training and the aim of sending them to short courses is to assist them to get grounded in their working areas and to enhance creativity and motivation. Organizations tend to go for short-term courses, normally tailor made to meet their current needs. Short-term courses in a location away from the workstation were recommended as it was noted that they allow maximum concentration of the participants. Visits to demonstration sites were highly recommended as it was considered to give practical hands-on experience/skills to the participants. This mode of delivery would make the training more practical and not just another academic endeavour.

Factors that influence sending staff for training were cited to be the relevance of the courses (86% of the respondents), the cost of travel and budgetary constraints (86% of

the respondents). Lack of institutional training plans based on training needs assessments within institutions was cited as a weakness in selecting the right staff for targeted training courses. Respondents cited that they would be allowed absence from their workstations for a period ranging from 1 week to 8 months.

An observation made by one of the respondents was that government and parastatal affiliated personnel are selected to attend training courses and that deliberate efforts should be made to involve participants from other sectors. It is also clear that in as much as training has been conducted; it remains in the hands of a select few who may not have a chance of application, as some of these aspects do not relate to their daily working tasks.

4.2 Tanzania

Responses from the questionnaires were from different categories of stakeholders including government institutions, academic institutions, legislators, decision makers, private sector and community groups in Tanzania. Most individuals were degree holders and key areas of professional experience varied from marine biology, fisheries management, environmental management, aquaculture, geology, oceanography, tourism, land management, social science, engineering and waste management. Seventy percent (70%) were involved in tourism activities, 90% in aquaculture, 50% in port and harbour activities, 70% in municipal and wastewater management, 50% in solid waste management and 30% in agriculture. Majority had some professional experience in fields, which they are not currently practicing.

Based on the environmental and management issues of concern, pollution and related deterioration of water quality seem to be leading issues across all sectors (Table 5) followed by issues such as habitat destruction (including mangroves), lack of institutional capacity for management of impacts, lack of control over impacts and modification of ecosystems. Most of the respondents indicated that their current work would definitely require an understanding of these environmental management issues.

Table 5: Environmental and management issues of concern in the different sectors targeted by the WIO-LaB project in Tanzania
(The percentage values indicate the proportion of respondents that citied the issue as a concern; only issues that scored 40% and above are cited)

KEY SECTORS	KEY ISSUES IDENTIFIED IN THE DIFFERENT SECTOR OF CONCERN IN THE WIO LaB PROJECT IN TANZANIA
TOURISM	Poor land use planning (80%) User conflicts (60%) Coastal erosion and accretion (40%) Habitat destruction including mangroves (40%)
AQUACULTURE	Pollution and related deterioration of water quality (53%) Introduction of alien species (47%) User conflicts (40%)
PORTS & HARBOURS	Pollution and related deterioration of water quality (73%)
COASTAL MINING	Unsustainable resource extraction (67%) Coastal erosion and accretion (60%) Lack of control over impacts (47%) Lack of institutional capacity for management of impacts (40%)
MUNICIPAL WASTE WATER	Pollution and related deterioration of water quality (73%) Lack of control over impacts (60%)
AGRICULTURE	Sediment runoff and related deterioration of water quality (73%) Pollution and related deterioration of water quality (47%) Coastal erosion and accretion (40%) Poor land use planning (40%)

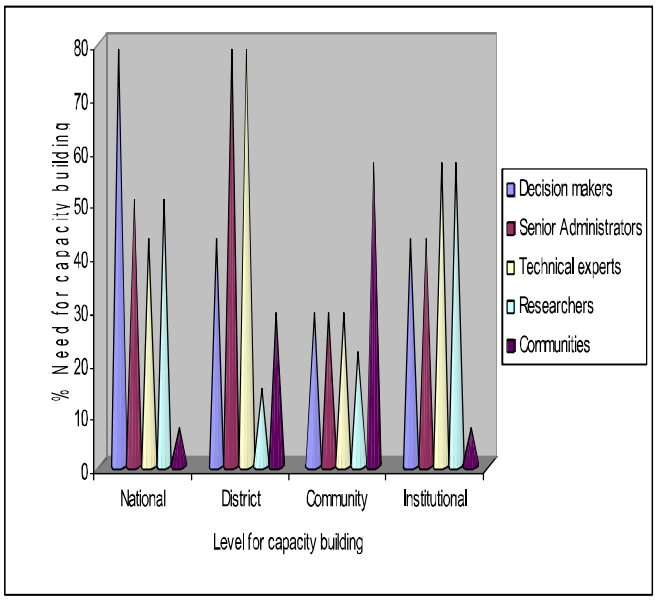


Figure 3: Levels at which capacity building is required in Tanzania

Based on questionnaire responses from Tanzania, majority indicated that, there is an urgent need for capacity building to all people of different positions at all levels of the society (Figure 3).

At the national level, decision makers were cited as the focus group, at the district level both senior administrators and technical experts were cited to be key for capacity building., communities were cited as the priority group at the community level while at the institutional level both technical experts and researchers were found to be the focus group (Figure 3).

Respondents felt that inadequate capacity for sustainable management; awareness creation on the value of natural resources and the need for protection of the environment and biodiversity greatly affect the protection of marine environment from land based activities. This is because the protection of marine environment requires application of sustainable techniques and a high degree of professional specialization. Priority issues that could effectively be addressed through training were identified as pollution and water quality deterioration, poor land use planning, municipal wastewater management and sanitation/sewerage systems, tourism, coastal erosion and accretion and modification of ecosystems.

Generally, most of respondents indicated competency in project/programme management and the score was 85%. In the area of professional skills, the score was 73%. The general score in the areas of technical skills was 67%. Areas that were identified for training are shown in table 6.

Table 6: Priority areas for training in each category in Tanzania
(Percentage of respondents that identified the priority areas is shown in brackets)

PROJECT MANAGEMENT	**PROFESSIONAL SKILLS**	**TECHNICAL SKILLS**
Fundraising (47%) Leadership (40%)	Strategic management (40%) Dispute resolution (33%)	Geographic Information Systems (73%) Social aspects (33%)

Majority considered the greatest strengths of the past/existing short/long-term training courses in the region to be the fact that they were based on identified needs (60% of the respondents) and the quality of trainers (53% of the respondents). Appropriateness of the courses to the target groups and applicability of the knowledge imparted scored high (47% of the respondents cited this in each case). The lack of post-course activities was considered to be a weakness (27% of the respondents cited this). An emphasis was placed on the need to be very strategic about topics taught and targeted participants. It was indicated that focus should be on district/field level staff affected by different issues and impacts in areas where these people are stationed. Since most courses leave trainees with knowledge/skills but without ability to practice/demonstrate these skills, it was suggested that efforts should be made to strengthen capacity building at local level.

Generally, the preferred mode for staff training by each respondent's organization varied from one individual to the other. However, 80% cited the preference of formal certificates and short courses on specialized technical subjects. Seventy three percent (73%) preferred in-service courses while 67% cited courses on general management.

In terms of recommended mode of delivery, 67% cited short courses on specialized technical subjects, 53% cited study tours to demonstration projects and 53% cited short courses taught at different sites and times. Formal certificates, short courses on general management and staff exchange were also cited as being important modes of course delivery. However, distance learning was not recommended. Key factors influencing staff training were indicated to be the relevance of courses (73%) and the cost of travel/budgetary constraints (67%). Staff shortages, timing of courses and work loads were also seen as pertinent factors that influence sending staff for training.

Furthermore, in the Tanzanian survey, travel restrictions and inadequate notification period were not considered to be key influencing factors.

Most individuals indicated that absenteeism affects the performance of work, especially for project-based work which requires strict delivery; in which case short courses (intensive but hands-on) are best and easier to accommodate. Most institutions are discipline-based so courses are sometimes not directly relevant. It was suggested that courses based on raising awareness in coastal environmental issues could be targeted at a wide range of backgrounds and these should be practical/hands-on though budget constraints always become a problem. Exchange of information should also be improved and local experts should train fellow locals.

4.3 Comoros

The professional experience of the respondents was in fisheries, public administration, fisheries management, wildlife management, engineering, marine affairs, tourism, environmental management, port and harbour management. Thirty two percent (32%) of the respondents were involved the tourism sector and 18% in municipal waste water and solid waste management respectively.

The awareness of issues of concern in the sectors targeted by the WIO LaB project was evaluated and the results of this are shown in Table 7.

Table 7: Environmental and management issues of concern in the different sectors targeted by the WIO-LaB project in Comoros
(The percentage values indicate the proportion of respondents that citied the issue as a concern; issues cited are those that scored the highest)

KEY SECTORS	**KEY ISSUES IDENTIFIED IN THE DIFFERENT SECTOR OF CONCERN IN THE WIO LaB PROJECT IN COMOROS**
TOURISM	Unsustainable resource extraction (46%) User conflicts (39%) Poor land use planning (39%)
AQUACULTURE	User conflicts (25%)
PORTS & HARBOURS	Pollution and related deterioration of water quality (29%) Sediment runoff and related deterioration of water quality (25%) Lack of institutional capacity for management of impacts (25%) Lack of control over impacts (25%)
COASTAL MINING	Unsustainable resource extraction (36%) Coastal erosion and accretion (25%) Lack of control over impacts (25%)
MUNICIPAL WASTE WATER	Pollution and related deterioration of water quality (46%) Lack of institutional capacity for management of impacts (39%) Lack of control over impacts (39%) Lack of laws and regulations (32%)
AGRICULTURE	Poor land use planning (32%) Introduction of alien species (29%) Lack of control over impacts (25%)

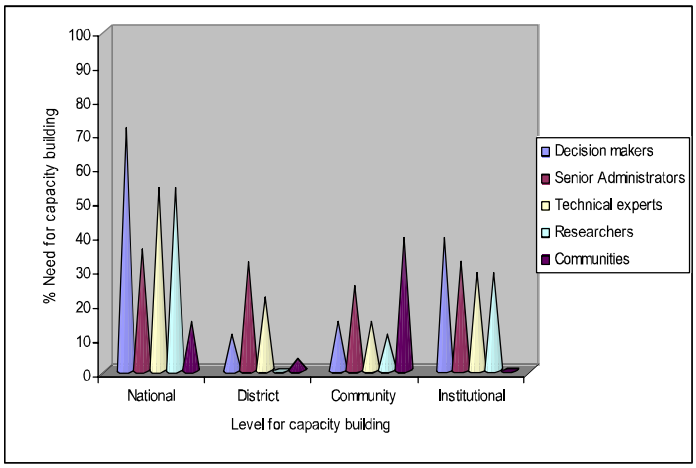


Figure 4: Levels at which capacity building is required in Comoros

The presence of capacity was evaluated at the national, district, community and institutional level and the different areas identified for capacity building are shown in Figure 4. At the national level, decision makers, technical experts and researchers were identified as key group for capacity building. At the district level senior administrators were identified as the focus group. At the community level, the area of capacity building were at the level of the community while at the institutional level the need for capacity building was highest among the decision makers and senior administrators.

Areas of expertise and skill in project/programme management, professional and technical areas were evaluated. The highest score (56%) was obtained in the area of project management, followed by professional skills (42%) and technical skills (39%). In the area of project management, priority areas identified for training was fundraising, work planning and budgeting (Table 8). In the area of professional skills strategic planning and science for management were the key areas for cited for training (Table 8). In the assessment of technical skills training GIS and sustainable coastal tourism were considered to be the priority.

Table 8: Priority areas for training in each category in Comoros
(Percentage of respondents that identified the priority areas is shown in brackets)

PROJECT MANAGEMENT	PROFESSIONAL SKILLS	TECHNICAL SKILLS
Fundraising (46%) Work planning (32%) Budgeting (32%)	Strategic planning (57%) Science for management (46%)	Geographic Information Systems (54%) Sustainable Coastal Tourism (43%)

The greatest strengths of the training courses offered in the past were cited to be the fact that they were based on identified needs (29%) and the quality of the trainers (25%). A shortcoming of courses was cited as the applicability of the course knowledge (29%). An evaluation of the preferred mode of training showed that 54% of the respondents preferred short courses on specialized technical subjects. The recommendations made by the respondents' targeted short courses on specialized technical subjects (68%). Distance learning was recommended by 16% of the participants. The cost of travel and budgetary constraints (46%) and the quality of trainers were cited as key factors influencing course attendance (46%). Staff shortages were cited as an important factor that influences course attendance (43% of the respondents), the relevance of the courses (39%). Respondents cited that they would be allowed to be away from their workstations for up to 7 months.

4.4 Madagascar

The professional experience of the respondents included oceanography, fisheries management, marine affairs, tourism, environmental management, waste management, public administration and environmental chemistry. Majority of the respondents were involved in aquaculture, solid waste and municipal waste water management (29% in each case).

The awareness of issues of concern in the sectors targeted by the WIO LaB project was evaluated and the results are shown in Table 9.

Table 9: Environmental and management issues of concern in the different sectors targeted by the WIO-LaB project in Madagascar
(The percentage values indicate the proportion of respondents that citied the issue as a concern; issues cited are those that scored 40% and above)

KEY SECTORS	KEY ISSUES IDENTIFIED IN THE DIFFERENT SECTOR OF CONCERN IN THE WIO LaB PROJECT IN MADAGASCAR
TOURISM	Pollution and related deterioration of water quality (71%) Coastal erosion and accretion (71%) Modification of coastal ecosystems (71%) Poor land use planning (71%) Lack of control over impacts (71%)
AQUACULTURE	Habitat destruction including mangroves (86%) Introduction of alien species (57%) Lack of control over impacts (57%) Pollution and related deterioration of water quality (43%) User conflicts (43%) Poor land use planning (43%) Lack of laws and regulations (43%)
PORTS & HARBOURS	Pollution and related deterioration of water quality (57%) Coastal erosion and accretion (43%) Modification of coastal ecosystems (43%)
COASTAL MINING	Lack of laws and regulations (43%) Lack of control over impacts (43%)
MUNICIPAL WASTE WATER	Lack of laws and regulations (71%) Lack of control over impacts (71%) Pollution and related deterioration of water quality (57%) Sediment runoff and related deterioration of water quality (57%) Lack of institutional capacity for management of impacts (57%) Modification of coastal ecosystems (43%) Habitat destruction including mangroves (43%)
AGRICULTURE	Sediment runoff and related deterioration of water quality (57%) Habitat destruction including mangroves (57%) Lack of institutional capacity for management of impacts (57%) Pollution and related deterioration of water quality (43%) Sediment runoff and related deterioration of water quality (43%)

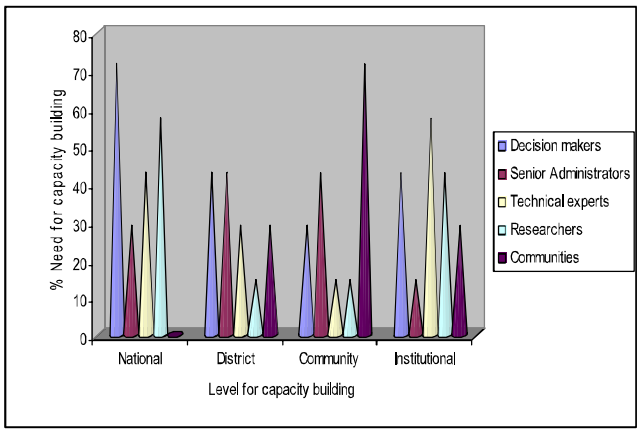


Figure 5: Levels at which capacity building is required in Madagascar

The presence of capacity was evaluated at the national, district, community and institutional level and the different areas identified for capacity building are shown in Figure 5. At the national level, decision makers and researchers were identified as key groups for capacity building. At the district level both decision makers and senior administrative officials were identified. At the community level, the areas of capacity building were at the level of the community while at the institutional level the need for capacity building was highest among the technical experts and researchers and decision makers.

In the area of expertise and skill in project/programme management, professional and technical skills were evaluated. The highest score (60%) was obtained in the area of project management, followed by professional skills (55%) and technical skills (53%). In the area of project management priority areas identified for training were work planning and budgeting (Table 10). In the area of professional skills strategic planning and fundraising were the key areas cited for training (Table 10). In the assessment of technical skills, areas identified for additional training were GIS. Planning aspects emerged as key areas identified for training (Table 10).

Table 10: Priority areas for training in each category in Madagascar
(Percentage of respondents that identified the priority areas is shown in brackets)

PROJECT MANAGEMENT	**PROFESSIONAL SKILLS**	**TECHNICAL SKILLS**
Work planning (57%) Budgeting (43%)	Strategic planning (57%) Fundraising (43%)	Geographic Information Systems (71%) Planning (57%)

The greatest strengths of the training courses offered in the past as well as presently were cited to be the quality of the trainers (57%), the fact that the courses have been based on identified needs (43% of the respondents cited this to be true). The weakness of the courses was cited as the applicability of the course knowledge and the appropriateness of the target groups (29% of the respondents cited this in both cases).

The recommendations made by the respondents' targeted short courses on specialized technical subjects (86%), modules at different sites and different times (71%) and short courses on general management (57%). Distance learning was also considered to be important and recommended by 14% of the participants. The cost of travel and budgetary constraints was cited as the most important factor that influences course attendance (80% of the respondents. Factors that influence staff attendance of courses were staff shortages (71%), the relevance of the courses (57% of the respondents) and

the quality of the training (57%). Respondents cited that they would be allowed to be away from their workstations for up to 1.5 months.

4.5 Seychelles

The professional experience of the respondents included land management, wildlife management, marine affairs, tourism, environmental management, waste management and environmental chemistry. Sixty percent (60%) of the respondents were involved agriculture, 40% in the tourism sector while 40% were dealing with solid waste and municipal wastewater management.

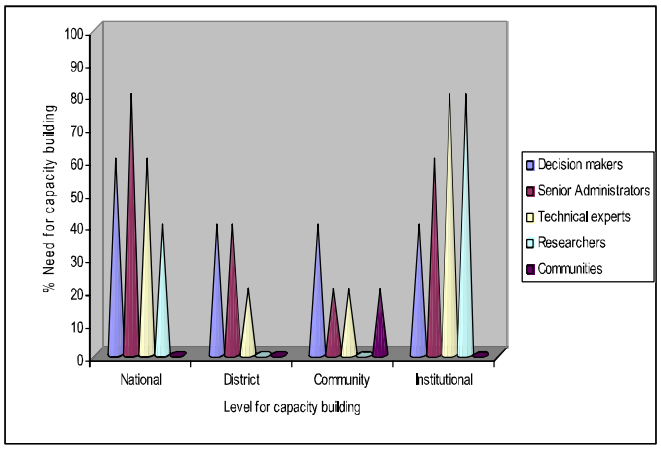


Figure 6: Levels at which capacity building is required in Seychelles

The awareness of issues of concern in the sectors targeted by the WIO LaB project was evaluated and the results are shown in Table 11.

Considering the presence of capacity at the national, district, community and institutional level the different areas identified for capacity building are shown in Figure 6. At the national level, senior administrators were identified as a key group for capacity building. At the district level both decision makers and senior administrative officials were identified. At the community level, the areas of capacity building were at the level of the decision makers while at the institutional level the need for capacity building was highest among the technical experts and researchers.

Table 11: Environmental and management issues of concern in the different sectors targeted by the WIO-LaB project in Seychelles
(The percentage values indicate the proportion of respondents that citied the issue as a concern; issues cited are those that scored the highest)

KEY SECTORS	KEY ISSUES IDENTIFIED IN THE DIFFERENT SECTOR OF CONCERN IN THE WIO LaB PROJECT IN SEYCHELLES
TOURISM	Sediment runoff and related deterioration of water quality (60%) Habitat destruction including mangroves (60%) User conflicts (60%) Pollution and related deterioration of water quality (40%) Coastal erosion and accretion (40%) Modification of coastal ecosystems (40%) Introduction of alien species (40%) Lack of institutional capacity for management of impacts (40%) Lack of interagency cooperation (40%)

KEY SECTORS	KEY ISSUES IDENTIFIED IN THE DIFFERENT SECTOR OF CONCERN IN THE WIO LaB PROJECT IN SEYCHELLES
AQUACULTURE	Pollution and related deterioration of water quality (20%) Habitat destruction including mangroves (20%) Introduction of alien species (20%) User conflicts (20%) Lack of institutional capacity for management of impacts (20%) Lack of laws and regulations (20%)
PORTS & HARBOURS	Pollution and related deterioration of water quality (60%) Sediment runoff and related deterioration of water quality (40%) Coastal erosion and accretion (40%) Habitat destruction including mangroves (40%) Lack of institutional capacity for management of impacts (40%)
MUNICIPAL WASTE WATER	Pollution and related deterioration of water quality (60%) Modification of coastal ecosystems (40%) User conflicts (40%) Poor land use planning (40%) Lack of institutional capacity for management of impacts (40%)
AGRICULTURE	Sediment runoff and related deterioration of water quality (60%) Pollution and related deterioration of water quality (40%) Sediment runoff and related deterioration of water quality (40%) Coastal erosion and accretion (40%) Habitat destruction including mangroves (40%) Modification of coastal ecosystems (60%) User conflicts (40%) Poor land use planning (40%) Lack of institutional capacity for management of impacts (40%)

Areas of expertise and skill in project/programme management, professional and technical skills were evaluated. The highest score (79%) was obtained in the area of project management, followed by professional skills (59%) and technical skills (46%). In the area of project management priority areas identified for training were budgeting and work planning (Table 12). In the area of professional skills strategic planning and dispute resolution were the key areas cited for training (Table 12). In the assessment of technical skills GIS and legal aspects emerged as key areas identified for training (Table 12).

The greatest strengths of the training courses offered in the past as well as presently were cited to be the fact that the courses have been based on identified needs (60% of the respondents cited this to be true), the appropriateness of the target groups (40%) and quality of the trainers (40%). The greatest weakness of the courses was cited as the lack of post course activities (60%). Some respondents also felt that applicability of the course knowledge was a weakness (40% of the respondents cited this in both cases).

Table 12: Priority areas for training in each category in Seychelles
(Percentage of respondents that identified the priority areas is shown in brackets)

PROJECT MANAGEMENT	PROFESSIONAL SKILLS	TECHNICAL SKILLS
Budgeting (60%) Work planning (40%)	Strategic planning (40%) Dispute resolution (40%)	Geographic Information Systems (60%) Legal aspects (40%)

The preferred mode of course delivery was in-service courses (100% of the respondents cited this) as well as short courses on specialized technical subjects (80%). The recommendations made by the respondents' targeted short courses on specialized technical subjects (100%) and short courses on general management (100%) with emphasis on staff exchanges and study tours to demonstration projects (80% of the respondents cited this in both cases). In-service courses were also found to be attractive (60%). The cost of travel and budgetary constraints was cited as the most important factor that influences course attendance (80% of the respondents). Other factors cited included the relevance of the courses (60% of the respondents) and staff shortages (40%). Respondents cited that they would be allowed to be away from their workstations for up to 10 months.

4.6 Mauritius

The professional experience of the respondents ranged from public administration, fisheries management, wildlife management, engineering, marine affairs, tourism, environmental management, port and harbour management. Fifty percent (50%) of the respondents were involved in port and harbour management, 25% in the tourism sector and municipal wastewater management respectively. The awareness of issues of concern in the sectors targeted by the WIO LaB project was evaluated and the results of this are shown in Table 13.

Table 13: Environmental and management issues of concern in the different sectors targeted by the WIO-LaB project in Mauritius
(The percentage values indicate the proportion of respondents that cited the issue as a concern; issues cited are those that scored the highest)

KEY SECTORS	KEY ISSUES IDENTIFIED IN THE DIFFERENT SECTOR OF CONCERN IN THE WIO LaB PROJECT IN MAURITIUS
TOURISM	Coastal erosion and accretion (75%) Pollution and related deterioration of water quality (50%) Introduction of alien species (50%) Unsustainable resource extraction (50%) Poor land use planning (50%)
AQUACULTURE	Modification of coastal ecosystems (50%)
PORTS & HARBOURS	Pollution and related deterioration of water quality (75%) Sediment runoff and related deterioration of water quality (50%)
COASTAL MINING	Sediment runoff and related deterioration of water quality (25%) Coastal erosion and accretion (25%) Unsustainable resource extraction (25%) User conflicts (25%)
MUNICIPAL WASTE WATER	Pollution and related deterioration of water quality (75%) Lack of laws and regulations (25%)
AGRICULTURE	Pollution and related deterioration of water quality (25%) Sediment runoff and related deterioration of water quality (25%) Habitat destruction including mangroves (25%) Modification of coastal ecosystems (25%) Introduction of alien species (25%) Poor land use planning (25%) Lack of interagency cooperation (25%) Lack of laws and regulations (25%)

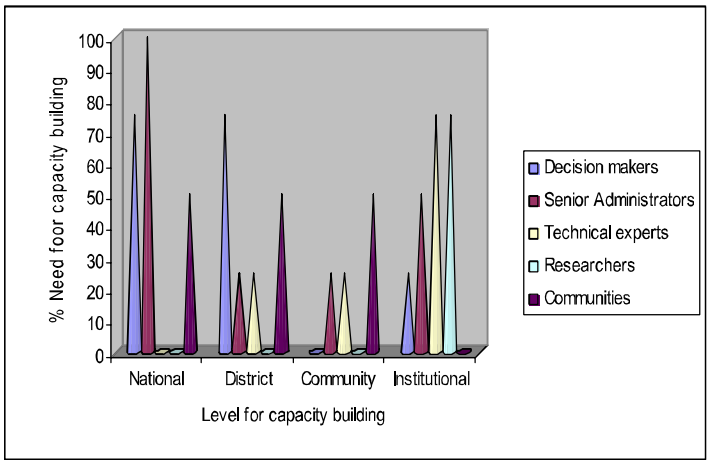


Figure 7: Levels at which capacity building is required in Mauritius

At the national level, senior administrators and decision makers were identified as key group for capacity building (Figure 7). At the district level both decision makers and communities were identified as the focus group. At the community level, the areas of capacity building were at the level of the community while at the institutional level the need for capacity building was perceived to be highest among the technical experts and researchers (Figure 6).

Areas of expertise and skill in project/programme management, professional and technical skills were evaluated. The highest score (67%) was obtained in the area of project management, followed by professional skills (61%) and technical skills (41%). In the area of project management priority areas identified for training were budgeting and project management and evaluation (Table 14). In the area of professional skills strategic planning was the key area cited for training (Table 14). In the assessment of technical skills areas that were identified for more training GIS and legal aspects emerged as key areas identified for training (Table 14).

Table 14: Priority areas for training in each category in Mauritius
(Percentage of respondents that identified the priority areas is shown in brackets)

PROJECT MANAGEMENT	**PROFESSIONAL SKILLS**	**TECHNICAL SKILLS**
Budgeting (75%) Project management & Evaluation (36%)	Strategic planning (75%)	Geographic Information Systems (75%) Legal aspects (50%)

The greatest strengths of the training courses offered in the past were cited to be the quality of the trainers (50%) and the applicability of the course knowledge (50%). The recommendations made by the respondents' targeted formal certificates (75%), short courses on specialized technical subjects (50%) and short courses on general management (50%). Study tours to demonstration projects were considered to be important by 50% of the respondents. Staff shortages were cited as the most important factor that influences course attendance (100% of the respondents). Work loads, the cost of travel and budgetary constraints as well as inadequate notification period were also considered to be important (50% of all respondents cited each factor as being important). Respondents cited that they would be allowed to be away from their workstations for up to 6 months.

4.7 South Africa

In South Africa the survey covered respondents from the Government Department of Education, the Marine and Coastal Educators Network (MCEN), SADC Regional Environmental Education Programme (SADC-REEP), the National Ports Authority of South Africa, the Provincial Coastal Working group in the Eastern Cape and tertiary education institutions.

A total of 40% of the respondents were involved in the tourism sector, 13% in aquaculture, municipal waste water management and solid waste management. 7% were engaged in port and harbours, coastal mining and agriculture. The awareness of issues of concern in the sectors targeted by the WIO LaB project was evaluated and the results are shown in Table 15.

Table 15: Environmental and management issues of concern in the different sectors targeted by the WIO-LaB project in South Africa
(The percentage values indicate the proportion of respondents that citied the issue as a concern; issues cited are those that scored the highest value)

KEY SECTORS	KEY ISSUES IDENTIFIED IN THE DIFFERENT SECTOR OF CONCERN IN THE WIO LAB PROJECT IN SOUTH AFRICA
TOURISM	User conflicts (53%) Habitat destruction (47%) Lack of institutional capacity for management of impacts (40%)
AQUACULTURE	Pollution and related deterioration of water quality (47%) Introduction of alien species (33%) User conflicts (33%) Lack of institutional capacity for management (33%)
PORTS & HARBOURS	Pollution and related deterioration of water quality (27%) Modification of ecosystems (27%) Lack of institutional capacity for management of impacts (27%) Lack of control over impacts (27%)
COASTAL MINING	Coastal erosion and accretion (33%) User conflicts (27%) Lack of institutional capacity for management of impacts (27%) Lack of control over impacts (27%)
MUNICIPAL WASTE WATER	Pollution and related deterioration of water quality (40%) Lack of control over impacts (33%) Lack of institutional capacity for management of impacts (27%)
AGRICULTURE	Sediment runoff and related deterioration of water quality (33%) Modification of ecosystems (27%) Lack of control over impacts (27%) Lack of institutional capacity for management of impacts (27%)

At the national level, decision makers and researchers were identified as the key group for capacity building (Figure 8) while at the district levels both technical experts and communities were identified. At the community level, the areas of capacity building were at the level of decision makers and the community while at the institutional level the need for capacity building was highest among the decision makers, researchers and communities.

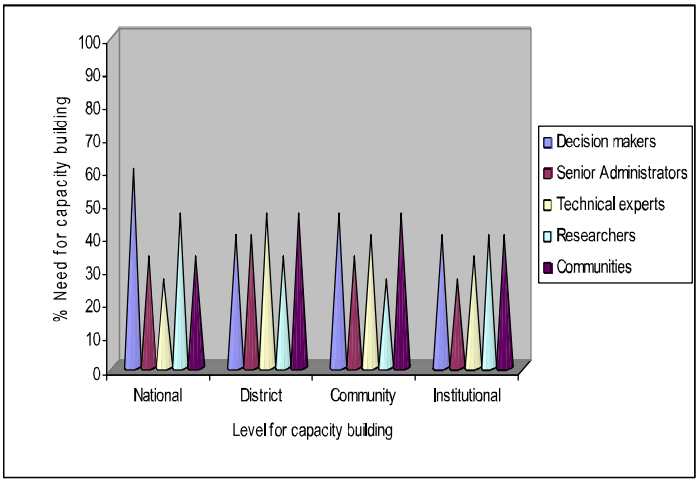


Figure 8: Levels at which capacity building is required in South Africa

It was felt that inadequate capacity at the different levels of society meant that there was a lack of capacity within local and provincial authorities to implement legislation. The lack of awareness of issues and impacts was also cited. Apathy was also cited within South African townships and the general feeling was that government policies should be self-help initiatives rather than development based on handouts. The lack of financial resources, infrastructure and human skills were also cited as issues that hamper implementation of policy.

Political involvement in the WIO-LaB project by decision makers on political and national level was cited as being important. This could be so structured that they are not burdened with too much information but be ensure that they support their local and provincial administrators. Awareness in communities also needs to be increased on good and bad practices on the coast.

Areas of expertise and skill in project/programme management, professional and technical skills were evaluated. The highest score (67%) was obtained in the area of project management, followed by professional skills (58%) and technical skills (50%). In the area of project management priority the area identified for training was supervision, (Table 16). In the area of professional skills demonstration skills, science for management, strategic planning and demonstration activities were cited as key areas for training (Table 16). In the assessment of technical skills the area that was identified for more training was planning (Table 16).

Table 16: Priority areas for training in each category in South Africa
(Percentage of respondents that identified the priority areas is shown in brackets)

PROJECT MANAGEMENT	PROFESSIONAL SKILLS	TECHNICAL SKILLS
Supervision (33%)	Demonstration skills (33%) Science for management (33%)	Planning (47%)

The greatest strengths of the training courses offered in the past as well as presently were cited to be the fact that the courses have been based on identified needs (40% of the respondents cited this to be true), the applicability of the knowledge imparted (47%) and the quality of the trainers (40%). The greatest weakness of the courses was cited as the lack of post course activities (13%).

Courses on general management were the most preferred (67%) as well as in-service courses (60%). Formal certificates as well as short courses in the form of modules delivered at different times and different sites scored 53% in terms of popularity. The issuance of formal certificates was seen as a way to boost attendance to the courses.

In terms of the recommended mode of delivery short courses on general management scored highly (53%), while formal certificate courses were also popular (47%). Respondents also emphasised the importance of courses on specialized technical subjects (40%) and study tours to demonstrations sites (40%). The importance of practical knowledge was cited as theory is often forgotten by course participants. Additionally, education backgrounds may vary which means that hands-on and demonstrative activities would motivate people more. Distance learning was recommended by 20% of the participants.

Factors that influence sending staff for training were cited to be the cost of travel and budgetary constraints (60% of the respondents). However, providing complete funding for participants was found to be challenging as it may not result in obtaining the most qualified personnel for the course. It was suggested that employers may be requested to cost share or have a rigorous selection process where participants apply for financial support which often results in employers sending appropriate participants.

Staff shortages, relevance of the courses, timing of courses and work loads were also considered to be priority issues (40% of the respondents for each). Respondents cited that they would be allowed to be away from their workstations for up to 3 weeks. Good notification times were emphasised to enable participants to schedule the courses into their busy work schedules.

In summary, most respondents from the different participating countries cited an awareness of the issues that impact this sector indicating that there is widespread knowledge base of the different issues of concern that are targeted by the WIO-LaB project. The evaluation of capacity within different levels of the society indicated that there is a need for training at all levels of the society with different training methods being used to impart skills to the different levels that were indicated by the survey. Although people had expertise and skill in project management and professional skills there was a big gap in the area of technical expertise with respondents citing the need for various technical training courses. Study tours to demonstration projects and staff exchanges were also recommended as key elements of course delivery in the countries surveyed. It was recommended that efforts should be directed to private sectors as the current training seems focused mainly on personnel from government institutions. It was also emphasised that training needs be in line with a national qualifications framework with proper accreditation for short courses. One respondent felt that WIO-LaB ideas will go a long way in training historically disadvantaged peoples of Africa especially when inland waters are involved as most of these people tend to be discouraged from getting into marine sciences.

5.0 SYNTHESIS OF TRAINING NEEDS

This section provides an overview obtained from the 88 responses received from the different countries of the WIO region. Although, the country reports highlight specific needs within each country, the data was merged to provide an overview of key focal areas of the WIO-LaB project for training in thematic areas that have been identified as Physical Alteration and Destruction of Habitats (PADH), Municipal Waste Water (MWW) and Legal aspects. Priority sectors of focus in the marine ecosystem that fall within these thematic areas have been identified as tourism, aquaculture, ports and harbours, coastal mining, municipal wastewater management and agriculture. These sectors were identified as areas that have direct environmental and management impacts on the marine ecosystem and the responses from the different countries showed a general awareness of these issues. Although the respondents were not involved directly in activities that target several of these areas, there was a general understanding of detrimental activities that have negative impacts on the marine environment.

Table 17 shows a summary of issues that were identified as priorities for training in Kenya, Tanzania, Comoros, Madagascar, Seychelles, Mauritius and South Africa. These issues cut across all the UNEP/GPA/WIO-LaB Project priority areas and proposed training programmes should be able to impart knowledge and skills that enable the trainees to tackle these issues of concern. For instance, training in pollution management and assessment of water quality would enable a trainee apply knowledge within the tourism sector, aquaculture, ports and harbors and all other sectors where pollution and water quality deterioration were cited as a concern.

Table 17: Summary of priority issues identified within all thematic areas of the WIO-LaB project. These issues represent areas for training focus.

WIO-LaB Thematic Areas/Sectors	PADH	MWW	LEGAL ASPECTS
TOURISM	Coastal erosion and accretion Habitat destruction including mangroves	Pollution and deterioration of water quality	User conflicts Poor land use planning
AQUACULTURE	Habitat destruction including mangroves	Pollution and deterioration of water quality Introduction of alien species	User conflicts
PORTS & HARBOURS	Sediment run-off	Pollution and deterioration of water quality	Lack of institutional capacity for management of impacts

WIO-LaB Thematic Areas/Sectors	PADH	MWW	LEGAL ASPECTS
COASTAL MINING	Coastal erosion and accretion Unsustainable resource extraction Sediment runoff		Lack of control over impacts
MUNICIPAL WASTEWATER	Modification of ecosystems	Pollution and deterioration of water quality	Lack of institutional capacity for management of impacts Lack of control over impacts Lack of laws and regulations
AGRICULTURE	Sediment runoff and related deterioration of water quality Habitat destruction including mangroves Modification of ecosystems	Pollution and deterioration of water quality	Lack of institutional capacity for management of impacts Poor land use planning

Training should provide trainees with the ability to recognize the impacts and to implement mitigation measures to control the impacts. The trainees should also be imparted with knowledge of the parameters to measure or evaluate in order to quantify an impact such as habitat destruction. Legal aspects should be integrated into both PADH and MWW training courses as the understanding of legal issues is important in the enforcement of control measures to mitigate impacts.

5.1 Target groups for training

The responses for capacity building varied between countries depending on the governance structures within each country. In South Africa the level of capacity building appeared to be similar for all levels (decision makers, senior administrators, technical experts, researchers and communities) cited while in other countries there were clear groups recommended for focus. The overall evaluation of capacity for all the countries merged together revealed specific focus groups at the national, district, community and institutional level as shown in Figure 9. At the national level decision makers emerged as the target of the training activities, at the district level the target was the senior administrators, at the community level, communities were identified as the target for training while at the institutional level, researchers and technical experts were identified as the priority groups for training (Figure 9).

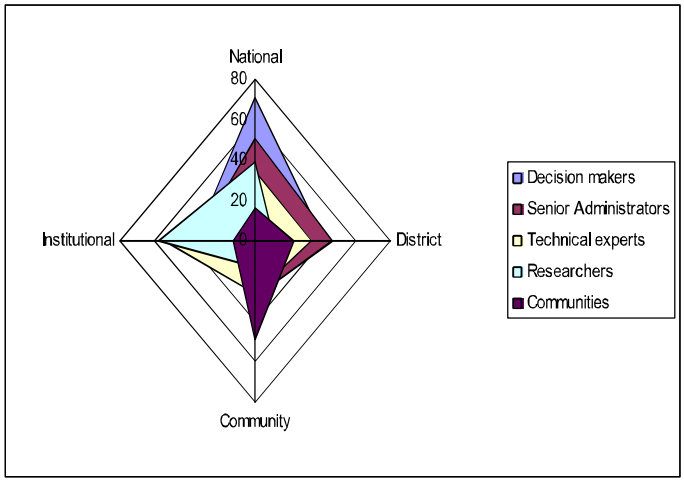


Figure 9: Target groups for capacity building

It is clear that the training programme has to tackle different groups at the different levels of governance and a variety of training and outreach methods would have to be used to reach out to the different target groups. Language would also have to be considered especially in French speaking countries where some respondents cited a need for courses in professional English. The quantity of information delivered would also have to be monitored to avoid information overload.

Based on the priority issues identified within the thematic areas of the WIO-LaB project (See Table 17) it is clear that each of the different target groups would deal with different aspects of the issues identified. Decision makers and senior administrators would deal with legislation, strengthening institutional frameworks and would be required to provide leadership in different areas therefore these areas would be the training focus for this group (Table 18). Communities would be required to participate in rehabilitation and sustainable resource extraction, therefore it is expected that training would focus on these aspects for community groups in the WIO countries. Researchers and technical staff are expected to impart technical knowledge on PADH issues such as coastal erosion and accretion, habitat destruction, sediment runoff, deterioration of water quality, modification of ecosystems and unsustainable resource extraction as well as MWW issues of pollution and deterioration of water quality. Researchers and technical staff would also be expected to have an understanding of legislation governing PADH and MWW priority areas; especially legislation governing standards of water quality (See Table 17). In view of these requirements for the different target groups, identified in the questionnaire survey, that the courses listed in Table 18 have been recommended.

Table 18: Target groups and recommended courses identified to meet the training needs within thematic areas of the WIO-LaB project

NATIONAL	**DISTRICT**	**INSTITUTIONAL**	**COMMUNITY**
Decision makers	*Senior Administrators*	*Researchers & Technical staff*	*Communities*
Legal aspects	Legal aspects	Habitat Rehabilitation	Habitat Rehabilitation
Leadership	Leadership	MWW courses to monitor water quality & treatment	Sustainable resource harvesting
		Sediment quality	
ICM course	ICM course	Legal aspects	

Training in for each of the target groups would have to be delivered in different ways. At the national level and district level where decision makers and senior administrators were found to be the target group for training, leadership training would be of benefit in enabling them to lead with influence and purpose. A general awareness of all the issues cited in the PADH, MWW and legal aspects would have to be imparted to this level but it has to be done within a short time frame, as this is a group of busy people who experience time constraints and would not attend long training courses.

Training in similar issues at the institutional level to researchers and technical experts would have to be done for a longer period and at a greater depth to empower this group to use the knowledge in their everyday activities and to relay the knowledge to the community level. For this group, hands on training and tours to demonstration projects would be critical.

At the community level, the training focus would have to be on community leaders or community groups. The delivery of training would also have to be modified to suit this target group and simplified to enhance understanding. Visits to demonstration projects where communities can have hands on application of the knowledge that they are gaining would have a high level of impact at this level.

5.2 Skill Assessment

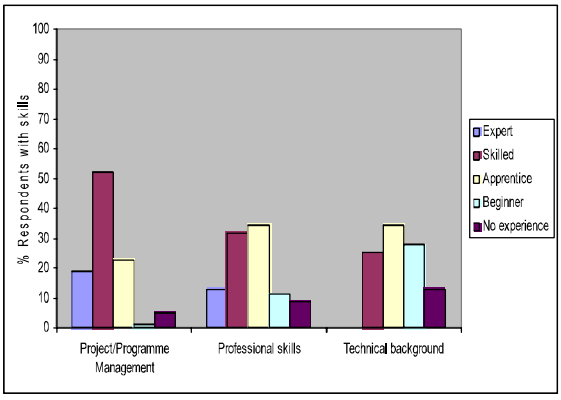


Figure 10: Level of expertise and skill in different areas of management

Different levels of proficiency were recognized in terms of proficiency in areas of programme/ project management, profession skills, and technical skills. Experts were those who indicated that they possessed a high level of mastery of the cited skills, while skilled people are those who indicated proficiency in practice but indicated that they were not skilled enough to teach. An apprentice had some knowledge but indicated a need for more training while beginners were considered to be inexperienced.

Generally, respondents reported high proficiency in programme/project management (mean score of all respondents was 74%) and in this area at least 20% indicated that they were experts and 50% considered themselves skilled (Figure 9). In the area of professional skills, the level of proficiency was 62% (mean score for all respondents). An equal proportion of respondents considered themselves skilled and an equal number considered themselves to be apprentices (30%) (Figure 10). Only 13% considered themselves to be experts. In the area of technical skills the level of proficiency was 54% (mean score for all respondents) and there was a general lack of experts with many considering themselves to be apprentices and beginners (approx. 30%).

From the data set, it is clear that the technical background has the most beginners and people with no experience thereby making it a critical area of focus. Areas for consideration in this area that were identified by respondents from the different countries were GIS, planning, legal aspects and sustainable coastal tourism.

Although the level of expertise was high in the area of project management, respondents from all the WIO countries cited budgeting, work planning, fundraising and leadership as areas for training. Emphasis should also be given to the area of professional skills with priority areas identified as strategic planning, dispute resolution, science for management and fundraising by the different respondents from the different WIO countries.

This assessment of skills shows that although training may be undertaken in the different thematic areas of WIO-LaB Project that have been identified, there is still need for the target groups (course participants) to be equipped with the skills cited to enable them to implement the knowledge gained through the recommended courses.

At the national level, decision makers and senior administrators would require leadership courses with some level of training in legal aspects and a focus on the cited project management skills. Emphasis of technical training would be provided to researchers and technical staff at the institutional level to enable them to undertake tasks of habitat rehabilitation and water and sediment assessments. Professional skills and some project management skills would be integrated in the courses recommended to enable those trained to fundraise and run projects after their training. Communities would be provided with technical skills to enable them to undertake rehabilitation activities and sustainable resource extraction.

Table 19: Priority skills to be integrated into the training courses for the different target groups

NATIONAL	**DISTRICT**	**INSTITUTIONAL**	**COMMUNITY**
Decision makers	*Senior Administrators*	*Researchers & Technical staff*	*Communities*
Project management budgeting, work planning, fundraising, leadership Professional skills: strategic planning, science for management, dispute resolution,		Project management: budgeting, work planning, fundraising, leadership Professional skills: strategic planning, science for management, dispute resolution, Technical skills: GIS, planning, legal aspects, sustainable coastal tourism	Technical skills: for use in rehabilitation of degraded areas and for sustainable resource management

5.3 Mode of course delivery

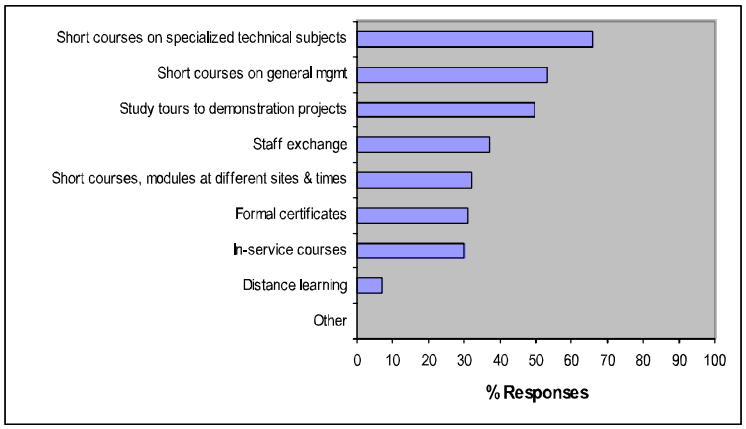


Figure 11: Recommended mode of course delivery

The strength of past courses was cited to be the fact that they were based on identified needs (44%) and the quality of trainers (43%) whereas the major weakness cited was the absence of post course activities (23%) as well as the applicability of the knowledge acquired (20%). Recommendations from the respondents indicated that the training duration would have to be short with emphasis on specialized technical subjects, short courses on general management and tours to demonstration projects as shown in Figure 10. Training would have to be through the practical application of theories and knowledge to every day issues of concern that have been highlighted in all sectors. Formal certification would also have to be considered to give courses credibility.

The cost of travel as well as the relevance of the courses would have to be taken into consideration so as to enhance participation in the courses (Figure 11). The trainers selected would have to be well qualified and post course activities would have to be integrated into the training courses undertaken by the WIO-LaB project. On average, respondents cited that they could be away from work for a period of 1 week to up to 10 months.

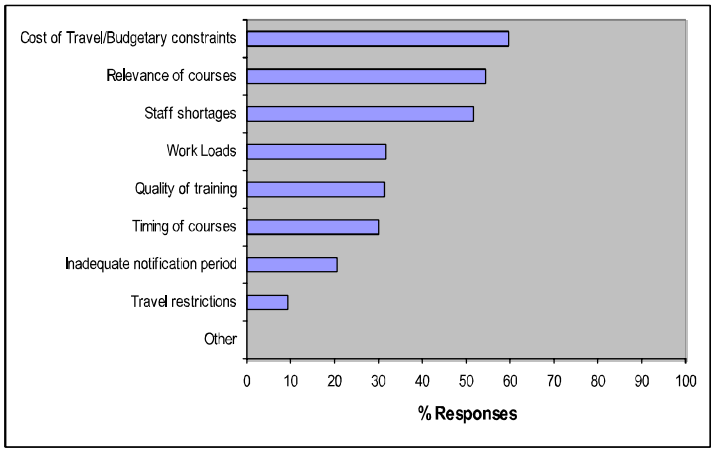


Figure 12: Factors that influence course attendance

5.4 Summary and Recommendations

The findings of this study shows that there are a broad range of formal education institutions (universities and colleges) that are able to impart basic knowledge and skills to students within each country in the WIO region. Additionally, there have been various capacity building activities in the WIO region that have focused on training personnel to undertake different aspects of project activities. However,

several of these short courses focus on training government and project staff with very few aiming to impart similar skills to communities and the different levels of governance identified in this survey. Therefore, it is recommended that the WIO-LaB project focuses on the different strata of society in imparting knowledge within the different thematic areas.

Based on the training needs assessment conducted, issues that were identified as priorities for training are:

i) **PADH:** coastal erosion and accretion, habitat destruction, sediment discharge/runoff and related deterioration of water quality, modification of ecosystems and unsustainable resource extraction;

ii) **MWW:** pollution and deterioration of water quality;

iii) **LEGAL ASPECTS:** user conflicts and legal framework for the resolution of these conflicts, land use planning, strengthening institutional frameworks and capacity for management of impacts, formulation of legislation to control the impacts of detrimental activities both on land and in the marine ecosystem

In this respect, it is clear that any training to be organized should provide trainees with the ability to recognize the impacts as well as identifying effective mitigation measures to control the impacts. Knowing which parameters to measure or evaluate to quantify the observed impact is also important. The proposed courses should also include legal aspects as the understanding of legal issues is important in knowing whether any proposed strategies aimed at addressing the impacts are within the law or not.

Furthermore, it was evident that the overall evaluation of capacity for all the countries revealed specific focus groups at the national, district, community and institutional levels. While at the national level, decision makers emerged as the target for capacity building, at the district level the target group should be the senior administrators and at the community level, communities in general were identified as the target for training. At the institutional level, researchers and technical experts were identified as the priority groups for training.

In this respect, delivery mechanisms for any proposed training courses will have to be different for each of these groups. In the case of decision-makers, awareness workshops would be sufficient to impart them with the relevant knowledge. Short courses on specialised technical subjects are recommended for researchers, technical experts and senior administrators at the district level. Hands-on training and study tours to demonstration projects are also important to technical experts. At the community level, training focusing on community leaders or groups should mainly be involved in study tours to areas where they could learn on site.

Technical expertise, professional skills and some project management skills were recognized as inadequate in this assessment and therefore there is need for WIO-LaB Project to ensure that the training programmes developed incorporate these aspects The analyses showed that many respondents identified technical background on topics such as GIS, legal aspects and planning, as a critical areas of focus for the proposed

training. Also professional skills on dispute resolution, strategic planning, science for management and fund raising, were identified as priorities for training. Areas in project management focusing on work planning, budgeting and leadership were also cited as priorities in skill development. It is therefore important for the WIO-LaB project to integrate skill development to enhance the ability of target groups to effectively utilize the training they receive

Post course activities should also be integrated into the courses developed. An example of a course where such activities were integrated is the course on *Learning and Performing: Developing Skills for Coastal Management Practitioners in the WIO region*. It is therefore important for training courses undertaken under the WIO-LaB project to assess their impacts by having measurable indicators which can be assessed through post course activities and follow-up of participants to determine how they have used the knowledge gained.

6.0 PROPOSED TRAINING COURSES

The main objective of the training needs assessment in relation to the activities and objectives of the WIO LaB project is to develop training programmes which should serve to develop the capacity required in order to effectively implement the various project activities as well as increase the capacity of stakeholders in the region to effectively manage and control the impacts of land-based activities on the coastal and marine environment.

From the needs assessment, a number of training courses have been proposed. These courses could be broadly categorized into general and specific courses. Only one general course has been proposed and it is on "Integrated Coastal Management (ICM) with the emphasis on PADH/MWW issues". The specific courses that are proposed are: (i) Course on Sediment and Water Quality Monitoring and Analysis; (ii) Municipal Wastewater Management (iii) Constructed wetlands and (iv) Habitat Rehabilitation/Restoration. Others proposed included a course on TDA/SAP (including NPA) development/formulation and a course on the development of leadership skills among the Focal Points of UNEP/Nairobi Convention as well as other senior government officials involved in the management of the coastal and marine environment.

The proposed training courses have been aligned to fit into the UNEP/GPA/WIO-LaB Project thematic areas and can be used to enhance effective implementation of project activities. Although there were several emerging training needs, these were prioritized to provide a few training courses. Such courses are aimed at increasing the scope of knowledge and expertise in the WIO-LaB Project thematic areas of PADH and MWW. Some of the training courses already exist with well developed curriculum and it is recommended that UNEP/WIO-LaB project uses these pre-existing training courses.

Two additional courses were proposed namely, "Course on strategic planning with a focus on TDA/SAP (including NPA) development" and "Course on Leadership: Leading with Impact". Several aspects of these courses were recommended in the needs assessment and it was felt they are important and should be conducted. The two

courses could be undertaken with the budgetary allocation of the WIO-LaB project. Justification for these two courses is provided in the following paragraphs.

In addition, Objective 3 of the WIO-LaB project also anticipates the preparation of an updated Transboundary Diagnostic Analysis (TDA) and Strategic Action Plan (SAP) for the WIO Region focused on land-based activities. These documents will be prepared with inputs from two other GEF-funded projects namely, the South-West Indian Ocean Fisheries Project (SWIOFP) and Agulhas and Somali Currents Large Marine Ecosystem (ASCLME) Project. In the preparation of TDA and SAP, the WIO-LaB project is responsible for providing information on land-based sources of pollution as well as provision of information on policy, legal and institutional reforms and needed investments as they relate to land based activities. SWIOFP will provide fisheries related inputs on industrial fisheries (on crustaceans, demersals, and non-tuna pelagics), while ASCLME will provide information on oceanography, productivity, artisanal and subsistence fisheries data.

For the purpose of ensuring that the countries are actively involved in the process of developing TDA and SAP, training courses highlighted in this report will be organized based on the Train-Sea-Coast course on TDA-SAP approach. Such courses will not only ensure that national experts are actively engaged in the process but will also help to build regional capacities for monitoring and evaluating process, stress reduction and environmental status information.

The WIO-LaB Project Steering Committee is responsible for, amongst others, providing overall strategic policy and management direction to the Project; reviewing and assessing the progress of the project; reviewing and approving the work plan and reviewing the quality of outputs produced. Other responsibilities include: reviewing the extent and effectiveness of stakeholder involvement; reviewing and approving TDA and SAP when completed and reviewing and monitoring the implementation of the project's outreach and communication strategy. For the members of the Steering Committee to be able to perform their duties effectively and efficiently, it is necessary to have training activities geared toward improving their individual capacities for leadership, participatory processes and communication.

6.1 General courses

6.1.1 Integrated Coastal Management (ICM) with the emphasis on PADH/MWWM issues

Target Trainees: Decision makers and senior administrators particularly those from the sectors such as tourism, mining, etc, who did not attend the previous ICM courses.

Rationale for the course: This course is a general course that would target decision makers and administrators with the aim of building their skills in ICM with special focus on issues relevant to PADH and MWW. Most of the issues raised are related to land use planning and legal aspects. The aim of the course is to impart knowledge to the trainees on the tools that they can use to address these issues.

Goals: In this course, the trainees will gain a general understanding of the principles of ICM and why such a planning tool is important in ensuring sustainable utilization

of coastal and marine resources. The participants to the course will gain an understanding of the impacts of pollution and water quality deterioration, poor land use planning, municipal wastewater management and sanitation/sewerage systems, coastal erosion and accretion and modification of ecosystems. Interlinkages between ecosystems (including the river-basin to coast interface) will be emphasized and the impacts of land activities on marine health will be emphasized through case studies. Basic legal aspects governing the PADH and MWW issues drawn from different countries in the region will be also be elaborated. Skills imparted to enable trainees to manage these impacts will be on project management encompassing leadership, fundraising, and conflict resolution.

Objectives:

The objectives of the proposed course are to:

- Build the capacity in ICM in non-traditional sectors such as mining, tourism and port and harbors;
- Share and exchange information of successful and failed case studies on management of issues relevant to PADH and MWW.

Proposed Training Approach: The proposed one-week course will use experiential, adult learning approach. The course could be held in one of the on-going ICM sites in the WIO region. Such a site should be able to provide participants with hands-on experience on the critical issues and how are they are being dealt with. Further, information from other ICM projects in the region will be used as background documents for the course.

Course organizers: Nairobi Convention/WIO-LaB Project in collaboration with the Regional Programme for the Sustainable Management of Coastal Zones of the Countries in the Indian Ocean (ReCoMaP) and WIOMSA

6.2 Specialized courses

6.2.1 Course on Sediment and Water Quality Monitoring and Analysis

Target Trainees: Researchers and technical experts/personnel who have formal training and experience in analytical chemistry and experience in the analysis of metals or organic contaminants as well as experience in operation of basic analytical equipment.

Rationale: Monitoring of water, sediment and marine biota is an integral part of any monitoring programme that is implemented in the WIO Region under the auspices of the WIO-LaB Project. An assessment of national capabilities for marine pollution monitoring in the WIO region was undertaken by International Atomic Energy Agency Marine Environment Laboratory (IAEA-MESL) based in Monaco (see De Mora, 2005). Recommendations made were focused on the establishment of a regional monitoring programme for heavy metals, nutrients and organic contaminants monitoring/assessment in marine biota and in marine sediments. Capacities of different laboratories within the different WIO countries were also evaluated during this assessment. None of the countries visited had a comprehensive national

monitoring programme though all countries apart from Comoros had capacity for the analysis of nutrients in water. Training needs in the handling and analysis of heavy metals and organic contaminants (pesticide residues) in marine biota and sediments were identified. There was a recommendation for the establishment of a Regional Reference Laboratory/Regional Activity Center (RRL/RAC) for Marine Pollution Monitoring at CSIR in Durban, South Africa.

This training needs assessment highlights the need to link training in sediment and water quality assessment to training in strategic planning whereby the trainees will be able to put together at least a basic institutional monitoring programme that can be used to input into a wider national monitoring programme. Post course follow up would be a critical component of this programme as it would allow trainees to be able to obtain input as they develop their strategic plans and fundraise.

Goals: Under the sediment and water quality training courses, the trainees will be equipped with knowledge of how to handle samples for organic contaminants, nutrients and heavy metal analysis. They will also be trained on how to operate basic analytical equipment for the analysis of the water, biota and sediment samples. Trainees will also be provided with knowledge of how to fundraise for the purchase of equipment for their own laboratories. They will also gain skills in good laboratory practice and result presentation including also skills that will enable them write good strategic plans for the implementation of an institutional water, sediment and biota quality monitoring plan.

Objectives: By the end of the course, the trainees should be able to:

- Sample effectively and prepare samples for organic contaminants, nutrients and heavy metal analyses;
- Conduct instrumental analysis;
- Set up laboratory equipment (also maintain and trouble shoot);
- Establish good laboratory practice procedures;
- Draft good fundraising proposals for basic laboratory equipment required for sampling and sample processing;
- Present the results both in report form and orally for consumption by different Stakeholders, and;
- Formulate a Strategic Action Plan for monitoring in their home institutions.

Proposed Training approach: The proposed course will use experiential, adult learning approach. Course could be held in established laboratories within the region. Learning will be hands on with mini projects formulated to enable participants to follow through laboratory procedures for handling samples, processing samples and data analysis. Post course activities may be geared towards proposal writing and linkages to donors. The number of proposals written and funding obtained may be used as an indicator of success of the course.

Course Organizer: Council for Scientific and Industrial Research (CSIR), International Atomic Energy Agency Marine Environmental Studies Laboratory (IAEA-MESL), Institute of Marine Sciences (IMS), Zanzibar and Nairobi Convention/WIO-LaB Project

6.2.2 Management of Municipal Waste Water (MWW)

Target Trainees: Technical experts and managers responsible for collection and treatment of wastewater. Trainees attending the course should have formal training and experience in relevant aspects of waste water management.

Rationale: There is a need for general knowledge and understanding on basic practices of wastewater management and impacts of uncontrolled discharge of waste water (including industrial effluents). Additionally it is important that technical aspects of wastewater management are integrated in the course in order to build the capacity to identify and select environmentally sound municipal wastewater management systems. Capacity needs assessment in the area of waste water management in the WIO region was conducted in 2003 in Tanzania by UNEP/GPA in collaboration with the UNESCO-IHE Institute for Water Education and WIOMSA. This assessment aimed at determining the skills, knowledge and attitudes of personnel involved in wastewater management. Basics of wastewater management and the implications of discharge into the marine environment, aspects of design, monitoring, quality control and implementation of pollution penalties were some of the recommended areas of for training that emerged from this assessment. The assessment was used as one of the source for developing the training manual as well as designing courses on municipal wastewater that were held in different municipalities in the region. The course consists of four modules namely: objective oriented planning (the project identification part of the project cycle); innovative technologies and financial approaches; stakeholders involvement (benefits of stakeholders involvement and how to do it) and presentation techniques and feasibility reporting.

Goals: Under the MWW course, the trainees will be provided with general knowledge on the basic practices of wastewater management. The trainees will be introduced to different analytical tools and provided with substantive information and skills on how to manage waste water problems. They will be imparted with knowledge of quality control parameters. Legal aspects of penalty enforcement will also be taught during the course as well as aspects of strategic planning/management. Trainees will also be impacted with knowledge of how to assess waste disposal practices of communities and how to educate communities on sanitation issues. Trainees will also learn how to fund raise for the maintenance of municipal sewage plants. Project management will encompass aspects of leadership, management of meetings, fundraising, organizational skills, budgeting, supervising, monitoring, evaluation and work planning.

Objectives: By the end of the course the trainees should be able to:

- Describe the impacts of MWW on the coastal and marine environment;
- Identify and involve stakeholders in MWW management sector;
- Recognize conventional and innovative approaches to MWW management;
- Design and implement municipal waste water management projects;
- Set up environmental quality objectives and standards (EQOs/EQSs);
- Monitor municipal waste water treatment plants for efficiency;
- Implement surveillance and inspection procedures;
- Enforce penalties and pollutant discharge fees;
- Evaluate the success of the municipal waste water management projects;

- Prepare presentations for exchange of knowledge;
- Communicate issues of municipal waste water and sanitation both in report form and orally for consumption by different levels of the society;
- Understand financial approaches to MWW management;
- Identify sources of financing through public-private partnership, and;
- Manage wastewater projects successfully and efficiently.

Proposed Training approach: The proposed course will provide hands on training as well as theoretical knowledge on issues of MWW management. The proposed course may be held in one of the WIO-LaB-supported demonstration project sites as such a site will provide hands-on experience on model waste water treatment systems. Visits to other functional wastewater treatment systems in the WIO region may also be an important component of this course.

Course organisers: UNEP/Nairobi Convention, WIO-LaB Project, UNEP/GPA, UNESCO-IHE, GPA-GSC Waste Water Training

6.2.3 Course on Constructed Wetlands for Waste Water Treatment

Target Audience: Technical experts at the municipality level who are responsible for treatment of wastewater.

Rationale: Constructed wetlands comprise one of the demonstration projects of the WIO-LaB project and it is appropriate to link the development these wetlands to training courses which pass on skills and expertise to technical experts from the different WIO countries. Post course follow up may be built into continuous monitoring of these wetlands. There is need to promote the use of constructed wetlands in the WIO Region as they are cheap and cost effective and have a high impact in terms of treatment of wastewater

Goals: The trainees will be equipped with knowledge of how to design and operate a constructed waste water treatment plant. They gain knowledge of the type of plants to use in such as constructed wetland, quality control parameters, and continued maintenance of such plants.

Objectives: By the end of the course the trainees should be able to:
- Develop/design constructed wetlands for waste water treatment;
- Set up environmental quality control standards;
- Monitor the constructed wetland for efficiency;
- Implement surveillance and inspection procedures;
- Evaluate the success of the constructed wetland, and;
- Run demonstration projects in their countries using the constructed wetlands model.

Proposed Training approach: The proposed course will provide hands on training as well as theoretical knowledge on constructed wetlands. The proposed course may be held in one of the WIO-LaB-supported demonstration project sites as such a site will provide hands-on experience on model constructed wetland treatment systems. Visits

to other functional wetland systems in the WIO region is also an important component of this course. Additionally, post course follow-up may be provided and continuous technical support from the trainers.

Course organizers: WIO-LaB Project, European Union funded project "Peri-urban mangrove forests as filters and potential phytoremediators of domestic sewage in East Africa" (PUMPSEA) and Faculty of Mechanical and Chemical Engineering at the University of Dar-es-Salaam.

6.2.4 Course on Habitat Rehabilitation/Restoration

Target Trainees: Technical experts, Researchers, Community Groups and NGOs.

Rationale: Many of WIO region's main coastal and marine ecosystems have either been physical altered or damaged by human activities and natural processes, some to the point where they no longer provide the myriad of beneficial functions and values with which they have long been associated with. Such ecosystems include seagrass beds, mangrove forests and coral reef. Knowledge of how to quantify different levels of habitat destruction in different marine and land areas are important and different modules should be structured to impart technical skills.

The objective of any habitat restoration activity is to restore and maintain the physical, chemical, and biological conditions necessary to allow the remaining natural habitat to function and evolve over time. Some pilot critical habitats restoration activities have been undertaken in different parts of the WIO region. These include: mangrove plantations (Kenya and Tanzania), dune restoration (South Africa) and island restoration (Seychelles). Studies in habitat rehabilitation/restoration should be based on the experience acquired from these examples and others from within and outside the region. It is also important to integrate skills that empower technical experts and researchers to communicate knowledge gained from this course. The course can be run in the form of modules that are taught in different WIO countries based on the presence of demonstration projects in these countries.

Goals: The habitats targeted in this course will be mangroves, deforested land and areas affected by coastal mining activities. Trainees should be able to quantify different levels of habitat destruction and gain an understanding of methods used to rehabilitate different environments using cost effective techniques. Trainees will gain knowledge on how to impart their knowledge to community groups and peer groups through presentations as well as techniques for the mobilization of large community groups for habitat rehabilitation activities.

Objectives: The main objectives of the proposed course are:

- to build the capacity needed for planning and implementing restoration/rehabilitation of key habitats;
- Introduce legal and institutional issues to be taken into consideration when planning and implementing restoration/rehabilitation activities, and;
- Share and exchange information of habitat rehabilitation/restoration

Proposed Training Approach: The proposed training course will use experiential, adult learning approach. Course could be held in an already rehabilitated area within the WIO region. If possible visits to intact and degraded areas may be included in order to provide participants with a perception of the criteria used to determine the level of degradation.

Course follow up is important as participants may require various levels of support to implement restoration projects and also to facilitate the exchange of experiences. The vetting process of participants for the courses would have to ensure that course modules would target participants with specific needs. This means that those in need of training in mangrove restoration attend that particular course while only those with a need of knowledge on island restoration attend this particular course.

Course organizer: WIO-LaB project in collaboration with WIOMSA, KMFRI (Mangrove restoration project in Kenya); Eduardo Mondlane University/GTA (Mangrove restoration at Lumbo in Mozambique); Nature Seychelles (Small island restoration in Seychelles) and the World Bank and GEF funded project Coral Reef Targeted Research and Capacity Building for Management (CRTR) (coral reef rehabilitation).

Duration: Three weeks with visits to demonstration sites and post course follow up and activities.

6.2.5 Course on Leadership: Leading with impact

Target Trainees: National Focal Points of the Nairobi Convention including senior government officials of environmental management agencies in the WIO Region.

Rationale: Nairobi Convention Focal Points and senior officials of environmental agencies in the WIO region provide the overall strategic policy and management direction of their respective countries in different organs of the Convention and organizations to which they belong to. The Focal points conduct annual review and assessment of the progress in the implementation of the Convention's Work Programme and its projects. Furthermore, they provide a mechanism for interaction with other partners, including but not limited to national research institutes, universities, private sector, NGOs, and bilateral partners. Similar tasks are also undertaken by senior officials of environmental agencies.

In relation to the WIO-LaB Project, the National Focal Points are charged with providing strategic guidance in the implementation of project activities and coordinating the activities of partners and stakeholders within the different countries. To enable them undertake their responsibilities, it is essential that their leadership skill are strengthened through participation in a specifically-designed course.

Goals: The course framework has been developed with the aim of imparting skills on effective and influential leadership and the target audience can be broadened to include trainees who are in different leadership positions.

Objectives:
The general objectives of the proposed course are to:

- strengthen leadership skills of the Nairobi Convention Focal Points and other senior government officials so that their performance could be improved;
- share and exchange information on their experiences on their roles.

Training approach: The course will be in modules that cover different aspects with some activities being undertaken at the trainee's own time and space, which means that there is an aspect of distance learning involved. Post course follow up that enhances discussions between the participants as they share leadership experiences would be encouraged.

Course organizer The UNEP/Nairobi Convention Secretariat, WIO-LaB Project, IOC of UNESCO and Groman Consulting SA.

6.2.6 Course on strategic planning with a focus on the process for the formulation/development of TDA/SAP for the Western Indian Ocean region

Target Trainees: National Focal Points of the Nairobi Convention; representatives of key academic and research institutions; as well as representatives of intergovernmental organizations such as IUCN and COI, NGOs and regional programmes/projects

Rationale: This training course to be implemented under the auspices of the Global Environmental Facility (GEF) is focused on strategic planning for transboundary water resources management. The development of a Transboundary Diagnostic Analysis (TDA) and the formulation of Strategic Action Programmes (SAP) are components of the GEF International waters programme that have been defined as one of the key outputs of the WIO-LaB project. TDA, in this context, is a scientific fact finding analysis used to determine the sources, causes and impacts of problems in transboundary waters with the aim of producing a Strategic Action Programme (SAP) which is a policy document that identifies policy, legal and institutional reforms and actions that are required in order to address the identified transboundary problems. A training programme has been developed by GEF to empower those participating in the process. The benefits of such training course would thus be two-fold: (i) such tools could be directly applied for the development of the TDA/SAP within the WIO-LaB Project context, and; (ii) it would provide trainees with skills for the development of TDA/SAP including other policy documents for the management of the coastal and marine environment. The inclusion of legal issues in training programmes emerged as a priority in this assessment and the TDA/SAP course would expose trainees to policy and governance structures within the different countries.

Goals: Provide trainees with skills to undertake diagnostic analysis of the key transboundary issues of concern within the WIO region and formulate Strategic Action plans.

Objectives: At the end of the course the trainee should be skilled in the following:

- Identify priority transboundary problems;
- Carry out an effective root-cause analysis of key transboundary problems;
- Conduct an analysis of governance structure;

- Understand the legal environment and policies (Governance analysis);
- Understand how to undertake stakeholder consultations, and;
- Determine reforms required to resolve coastal management issues.

Training approach: The course may be in modules that cover different aspects with some activities being undertaken at the trainee's own time and space which means that there is an aspect of distance learning involved. Post course follow up that enhances discussions between the participants as they share leadership experiences would be encouraged. The course should also be practical, and it is therefore recommended to link the training programme to the practical TDA/SAP development process. In other words, the participants should use the WIO transboundary problems as a practical case study.

Organizers: WIO-LaB Project, SWIOFP, ASCLME and the Secretariat of the Nairobi Convention

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ANNEX I: Terms of Reference Training and Educational Needs Assessment

1. Context

The project "Addressing Land-based Activities in the Western Indian Ocean", also referred to as "WIO-LaB Project", is implemented by the United Nations Environment Programme (UNEP), and is financed by the Global Environment Facility (GEF) and the Norwegian Government. The WIO-LaB Project focuses on addressing major land-based activities (LBA) in the Western Indian Ocean (WIO) Region and represents a strong partnership between the WIO Countries (Kenya, Tanzania, Mozambique, South Africa, Madagascar, Seychelles, Comoros and Mauritius). The project basically aims to achieve three major objectives: 1) Reduce stress to the ecosystem by improving water and sediment quality; 2) Strengthen regional legal basis for preventing land-based sources of pollution; and 3) Develop regional capacity and strengthen institutions for sustainable, less polluting development. The project has a four-year implementation plan (2005-2008), addressing priority issues on Land Based Activities in the Western Indian Ocean Region. The project is executed within the framework of the action plan of the Nairobi Convention, and is furthermore meant to serve as a demonstration project for the UNEP Global Programme of Action (GPA) for the Protection of the Marine Environment from Land-Based Activities (LBA).

Within the context of its third objective, the WIO-LaB Project Management Unit (PMU) wishes to execute an assessment of training and educational needs in relation to its activities and objectives in the WIO Region. The Training and Educational Needs Assessment should lead to the development of a Training and Educational Programme which should serve (i) to develop the capacity required in order to effectively implement the various project activities, (ii) ensure that the capacity of stakeholders in the region to effectively manage and control the impacts of land-based activities on the coastal and marine environment is increased, and (iii) the increase awareness of the general public on the importance and means of addressing the impacts of land-based activities to the coastal and marine environment, through the development and implementation of, and support to existing educational programmes.

2. Overall responsibility

The overall responsibility of the Contractor is to assist the WIO-LaB Project Management Unit (PMU) in the execution of a Training and Educational Needs Assessment related to the activities and objectives of the project.

The Contractor will also be responsible for the development of a Training and Educational Programme for the project, in close cooperation with the WIO-LaB Project PMU, UNEP/GPA, the Nairobi Convention Secretariat and other key regional stakeholders. The specific duties and responsibilities are defined in section 3 below.

3. Duties and responsibilities:

A. Determine training needs on LBA in the project countries:

The Contractor shall:

- Identify training needs for different categories of stakeholders including Legislators; Decision makers; Private sector; Community groups, etc., through review of prior assessment work and experiences, where available, and through Training Needs Assessment Surveys where such is not available[1];

- On the basis of the results of the Training Needs Assessment survey, select priority training requirements for the region addressing LBAs;

In doing so, the Contractor shall:

- Interact directly with National Focal Points for the WIO-LaB Project including members of the various Task Forces established by the project namely, Municipal Wastewater (MWW) Task Force, Physical Alteration and Destruction of Habitats (PADH) Task Force and Legal and Technical Review (LTR) Task Force, as well as with institutions involved in the Water, Sediment and Biota Quality Component of the project.

- Take consideration of the results of earlier executed training needs assessments on MWW and Water and Sediment Quality Monitoring, as well as the experiences and feedback from earlier training sessions in this regard. The Contractor will consult reports of these assessments, as well as their custodians (UNEP/GPA, UNESCO-IHE, IAEA Monaco and CSIR Durban) in order to obtain inputs for the comprehensive needs assessment under these Terms of references.

- Organize and facilitate a training needs analysis session during the second regional MWW and PADH Task Force meetings scheduled to be held in the Comoros in the period 26-28 October 2005.

- Facilitate and provide inputs for the establishment of a discussion forum on training needs for the WIO-LaB project website.

B. Determine educational needs on LBA in the project countries:

The Contractor shall:

- Identify relevant activities on education curriculum development through consultations with the National Educational Institutes.

[1] It is noted in this aspect that earlier needs assessments where carried out on MWW (by WIOMSA and UNESCO-IHE on behalf of UNEP/GPA) and Water and Sediment Quality Monitoring (by IAEA in collaboration with the CSIR on behalf of the WIO-LaB PMU). Consequently, additional survey work on these topics will not be required.

- In consultation with the National Focal Points, identify priorities and opportunities for supporting educational programmes and activities, including:
    - School activities such as competitions, open days, environmental clubs, visits to MPAs and theme parks, etc.);
    - Support to curriculum development;
    - Development of awareness building materials for schools and learning institutes;
    - Training for school teachers on LBA themes; and
    - Support to MPAs to train professional guides for school programmes.

In doing so, the Contractor shall:

- Interact directly with National Focal Points for the project, National Institutes of Education (Including Teachers Training Colleges) as well as relevant educational institutions and other relevant stakeholders.

- Facilitate and provide inputs for the establishment of a discussion forum on educational needs for the WIO-LaB project website.

C. Develop a Training and Educational Programme for the project:

The Contractor shall:

- Develop a Training and Educational Programme for the project, based upon the findings and priorities set as part of part A and B of this Terms of References. The Programme will include:

    - Training activities related to the effective implementation of project activities;
    - Training activities related to general capacity building in the field of LBA management;
    - Support to educational programmes and school activities (e.g. school competitions, open days)
    - Recommendations for the development of awareness material to be used for educational purposes

- Prepare detailed LBA training curricula using existing capacity and existing courses, where possible.

- Identify and make recommendations with regard to potential educational institutions/organizations in the WIO Region and beyond that could assist in the development and/or implementation of the various training and educational activities in countries participating in the implementation of the WIO-LaB Project.

In doing so, the Contractor shall:

- In consultation with the WIO-LaB PMU, prepare a draft Training and Educational Programme to be presented for consideration to the Project Steering Committee.

- Finalize the Training and educational Programme on the basis of comments received from the Project Steering Committee;

3. Deliverables

The assignment will result in the following deliverables and their respective timelines:

Deliverable	Timeline
Plan of approach, including questionnaire for assessment, list of stakeholders and means of interaction	15 October 2005
Facilitate a session on training and educational needs during 2nd MWW and PADH Task Force meetings	26-28 October 2005
Draft Training and Educational Needs Assessment	15 November 2005
Final Training and Educational Needs Assessment	15 December 2005
Draft Training and Educational Programme	31 December 2005
Final Training and Educational Programme	28 February 2006

4. Job requirements:

- Experience in the execution of training needs assessments.

- Good knowledge and understanding of the technical and institutional subject matters involved in LBA management (i.e. MWW management, PADH, Legal aspects, monitoring and assessment);

- Access to a good network of institutions, NGOs and other organisations in the field of LBA and coastal and marine environmental management in the WIO region;

- Capacity to draft Training Programmes and Reports in either English or French;

5. Type of contract:

The assignment will be executed on the basis of a memorandum of Understanding to be established between Contractor and UNOPS. Implementation of the assignment will be spread over the period September 2005 – March 2006.

6. Supervision given to the assignment:

The work of the Contractor will be supervised by the WIO-LaB Project Manager.

ANNEX II: Brief Description of the SEACAM's Guidelines

Guidelines for the Environmental Assessment of Coastal Tourism

This publication is based on the review existing guidelines, best practices and lessons learned, and assessment of their relevance to the region. These guidelines were presented and reviewed in two training seminars attended by participants from in the region. The first training course was held in October 1998 in South Africa and the second was held in Madagascar in March 1999.

The main purpose of the guidelines is to provide a tool for responsible tourism development in the region.

- Identifying, managing and mitigating the impacts of tourism developments on the environment and cultural resources in the coastal areas
- Proposing measures that can be taken by government agencies, developers, NGOs and communities for the prevention or mitigation of environmental problems and for the enhancement of environmental assets for tourism
- Providing general EA methodologies as well as technical guidelines on the management of coastal tourism management

The core of the manual lie the technical guidelines, ie Chapters 5 and 6. Chapter 5 focuses on aspects of the environmental assessment of tourism, including project cycles, impacts assessment, institutional involvement and specific techniques. Chapter 6 provides technical guidelines and quality standards for tourism development in coastal areas as well as the requirements of Certification and Accreditation Programmes. Such Programmes include: International Organization for Standardisation (ISO); Blue Flag Campaign and Green Globe

Guidelines for the Environmental Assessment of Coastal Mining

SEACAM commissioned the CSIR to prepare guidelines for EA of coastal mining. The consultants undertook a review of existing EA guidelines, best practices and lessons learned in coastal mining. The guidelines were reviewed by a group of international and regional experts, and their use tested through a training course on EA of coastal mining. The purpose of the guidelines is to improve the environmental assessment capacity for coastal mining development in a variety of stakeholders groups in WIO region.

The technical Chapters are 7, 8 and 9. Chapter 7 contain a description of the EA process, with a particular emphasis on EIA. This chapter outlines the process of public involvement in the EIA process, and details the different forms of public involvement, and how the public can be involved, at which stages of the EIA process. Chapter 8 provides guidelines for mitigating impacts on the biophysical, social and economic environments. Chapter 9 provide a set of guidelines for acceptable Small-scale mining (SSM) activities that impose minimal impacts to the environment.

Guidelines for the Environmental Assessment of Coastal Aquaculture Development

The overall objective of these guidelines is to improve the environmental assessment capacity for coastal aquaculture developments in a variety of stakeholders groups in WIO region. They provide practical and technical information to reduce and mitigate the environmental and social impacts of coastal aquaculture development in the region.

ANNEX III: Training Needs Assessment Questionnaire

The project "Addressing Land-based Activities in the Western Indian Ocean", also referred to as "WIO-LaB Project", is implemented by the United Nations Environment Programme (UNEP), and is financed by the Global Environment Facility (GEF) and the Norwegian Government. The WIO-LaB Project focuses on addressing major land-based activities (LBA) in the Western Indian Ocean (WIO) Region and represents a strong partnership between the WIO Countries (Kenya, Tanzania, Mozambique, South Africa, Madagascar, Seychelles, Comoros and Mauritius). The project basically aims to achieve three major objectives: 1) Reduce stress to the ecosystem by improving water and sediment quality; 2) Strengthen regional legal basis for preventing land-based sources of pollution; and 3) Develop regional capacity and strengthen institutions for sustainable, less polluting development. The project has a four year implementation plan (2005-2008), addressing priority issues on Land Based Activities in the Western Indian Ocean Region. The project is executed within the framework of the action plan of the Nairobi Convention, and is furthermore meant to serve as a demonstration project for the UNEP Global Programme of Action (GPA) for the Protection of the Marine Environment from Land-Based Activities (LBA).

Within the context of its third objective, the WIO-LaB Project Management Unit (PMU) wishes to execute an assessment of training and educational needs in relation to its activities and objectives in the WIO Region. The Training and Educational Needs Assessment should lead to the development of a Training and Educational Programme which should serve (i) to develop the capacity required in order to effectively implement the various project activities, (ii) ensure that the capacity of stakeholders in the region to effectively manage and control the impacts of land-based activities on the coastal and marine environment is increased, and (iii) the increase awareness of the general public on the importance and means of addressing the impacts of land-based activities to the coastal and marine environment, through the development and implementation of, and support to existing educational programmes.

WIOMSA on behalf of the UNEP-GEF Project on Addressing Land-based Activities in the Western Indian Ocean (WIO-LaB) is requesting your views, suggestions and ideas regarding training needs in relation to the WIO-LaB project activities and objectives. Your contribution will be of tremendous value in the process of developing a Training Programme for the project.

You can complete the questionnaire in *any or all* of the following ways:

1. The *quick version*, for those who have very limited time – please check the boxes (you can of course also make comments where you wish);
2. The *full version*, where you tell us your views and ideas in the questions which are open-ended, as well as checking the boxes;
3. The *group-work version*, where you discuss each question with a group of associates (one person acts as rapporteur, filling out the questionnaire with group comments).

You are kindly requested to fill out the questionnaire and return it to juku@kmfri.co.ke (cc julius@wiomsa.org) before **20h December 2005.** Kindly provide your name and contact information. If you are filling the questionnaire as a group, provide the information of the contact person from the group.

Your Name	***Organisation***	***Country***

1. General Information

i) Highest educational degree obtained, and in what subject? (If the questionnaire is filled by a group indicate the educational background of members)

ii) Key areas of Professional experience (*√appropriate box[es]*):

- ☐ Marine Affairs
- ☐ Geology
- ☐ Engineering
- ☐ Oceanography
- ☐ Land Management
- ☐ Tourism
- ☐ Marine Biology
- ☐ Law
- ☐ Economics
- ☐ Business Administration
- ☐ Public Administration
- ☐ Wildlife Management
- ☐ Fisheries Management
- ☐ Forestry
- ☐ Agriculture
- ☐ Social Sciences
- ☐ Waste Management
- ☐ Environmental Management
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

iii) Is your current position dealing with any of the sector below, under what capacity and provide description of your responsibilities:

Sector	Tick	Under what capacity?	Key areas of responsibility in current position
Tourism			
Aquaculture			
Ports and harbours			
Coastal mining			
Municipal Waste Water Management			
Solid Waste Management			
Agriculture			

iv) Within the following sectors targeted by the WIO-LaB project, list at least three environmental and management issues of concern per sector:

	Tourism	Aquaculture	Ports and harbours	Coastal mining	Municipal Waste Water	Solid Waste Management	Agriculture
Pollution and related deterioration of water quality							
Sediment runoff and related deterioration of water quality							
Coastal erosion and accretion							
Habitat destruction (including mangroves)							
Modification of ecosystems							
Introduction of alien species							
Unsustainable resource extraction (e.g. from sand and mineral extraction)							
User conflicts (e.g., tourism *vs*. coastal communities, artisanal *vs*. commercial fisheries, aquaculture/mariculture *vs*. tourism)							
Poor land use planning (e.g., unplanned and unregulated tourism development)							
Lack of inter-agency cooperation/coordination							
Lack of institutional capacity for management of impacts							
Lack of laws and regulations							
Lack of control over impacts							
Other, specify							
Other, specify							

v) Does your current work require an understanding of these environmental and management issues and how to deal with them? If yes, please explain

vi) Inadequate capacity building has been identified as one of the main barriers to implementing measures to protect the marine environment from land-based activities. At what level/position do you think the capacity building is urgently needed?

	National	District	Community	Institutional
Decision-makers (MPs, Ministers, Directors)				
Senior administrative officials				
Technical experts				
Researchers				
Community				

vii) In your opinion, in what ways has inadequate capacity affected the protection of marine environment from land-based activities?

viii) Out of the issues mentioned in (v) above, list three priority issues that could be effectively be addressed through training:

1.

2.

3.

2. Assessment of training needs on Land-based activities

INSTRUCTIONS

Please complete the questionnaire based upon your current skill level by placing the number (1 to 5) that best describes you skill level in the box to the left of the skills presented in the following form. If you are filling the questionnaire as a group, indicate the area where there is a dominance of your collective skills

SCALE:

5 – **Expert.** I am knowledgeable and skilled in this area. An expert is a person having, involving, or displaying special skill or knowledge derived from training or experience; one with the special skill or knowledge representing mastery of a particular subject.

4 – **Skilled.** I am proficient in the practice, but not skilled enough to teach a course. A skilled person uses his/her knowledge effectively and readily in execution or performance of his/her duties and assignments. A skilled person possesses a learned power of doing something competently.

3 – **Apprentice.** I have some knowledge and skills in this area, but could do better with more training. An apprentice is a person who is learning by practical experience under skilled workers a trade, art, or vocation.

2 – **Beginner.** I have heard about this subject, and may have some modest experience. A beginner is an inexperienced person.

1 – **No experience.** I have no knowledge or skills in this area. An inexperienced person lacks any practical experience.

For each skill, an *example* is provided to clarify what is meant. Your answer should not be limited to the example. Your response should be based on whether you could undertake a similar task or not.

PROJECT/PROGRAM MANAGEMENT

	Leadership: You are able to set a long-term agenda and convince people to support that agenda. You are able to redirect tension between individuals or groups and get them to cooperate in productive ventures.
	Managing and conducting meetings: You have been asked to organize and run a meeting of various stakeholders to discuss environmental issues in your areas and initiating a plan to address them.
	Fundraising: You know how to write a grant proposal to get financial support for funding a new community management programme.
	Organization skills: If placed in charge of a project to clean up beach in your neighbourhood, could you organize and lead a group of volunteers to execute the exercise.
	Budgeting: You have been asked to write a budget for production of a newsletter for you organization. You know what items should be considered, i.e. items that the budget should contain.
	Supervising: You are the supervisor of a small unit of employees working on a monitoring exercise done by the community. You are responsible for evaluating the performance of the people that you are supervising. You know how to review and evaluate their performance.
	Work Planning: You are head of a project implementation unit that is responsible for developing management plans; you have to submit your annual work plans to the donor. You know how to develop and organize a work plan for a multi-facet project.
	List two (2) priority areas under this category that you would like to get training in:

Total _____

PROFESSIONAL SKILLS

	Dispute Resolution: If different stakeholders are in conflict with regards to environmental issues in your area, you are familiar with techniques that will help to resolve their dispute.
	Facilitation: The Director of your office has decided that it is a good idea to support the development of a technical institute to train fisheries managers. You know how to develop and lead a group though a consensus-building exercise that uses current facilitation techniques.
	Strategic Planning: You are the leader of an environmental management NGO. The board of directors has requested that you and your staff prepare a ten year organizational plan. You are able to develop this plan and to position the organization so that is will continue to be successful for the next decade.
	Communication: You have been asked by your supervisor to conduct a national awareness raising campaign about the use of destructive fishing gears and the new regulations recently approved. You know what different tools can be used to raise awareness, and how to successfully apply the correct tools in order to reach the target audience.
	Fundraising: A local fish landing market needs financial assistance to install a potable (uncontaminated) water pipeline. Your organization does not have the funding to support this activity, **but** you know how to contact diverse sources to solicit funds.
	Public Education: A local coastal community is concerned with the decline of its fish stock. The community realizes the value of protecting their local fishery, but does not know what to do about it. You know how to implement a community education program that will help reduce the loss of fishing.
	Science for management: You know how to build a bridge between the scientific and management community to ensure that reliable knowledge is used in the policy process. Fisheries science information needs.
	Demonstration Activities: You can define the value of demonstrating and testing implementation strategies; you can define criteria for selecting demonstration activities.
	List two (2) priority areas under this category that you would like to get training in: 1) 2)

Total _____

TECHNICAL BACKGROUND

	Mangroves: You know that mangrove are nursery and breeding grounds of fish and how hey link with other ecosystems and can define the impacts of mangrove clearing and can offer ways to mitigate destructive mangrove cutting practices
	Geographic Information Systems (GIS): You know what GIS is and how to use it to find answers to difficult coastal management issues.
	Mariculture: You can define mariculture, select appropriate sites for mariculture activities, select which mariculture activities are most suitable for an appropriate area and can present good practices for mariculture operations.
	Social aspects You are able to make a general assessment on households and livelihood strategies, property rights, local knowledge and other social aspects.
	Planning: You understand the basic guidelines of urban and rural planning and can match planning situations with planning tools. Also information on variance and uncertainty in fisheries management.
	Legal: You understand how laws and policies are developed, adopted and enforced.
	Sustainable coastal tourism: You are aware of the environmental impacts of coastal tourism and different tools for assessment impacts of tourism on environmental and coastal communities.
	List two (2) priority areas under this category that you would like to get training in: 1) 2)

Total _____

FOLLOW-UP QUESTIONS

Areas where I have the most expertise (please list 2): 1) 2)
Areas where I have the most training (please list 2): 1) 2)
Areas where I would like to have more training: 1) 2) 3)

3. Assessment of training capacity on Land-based activities

i). List training courses or workshops, on issues related to the areas of focus of WIO-LaB project (i.e. tourism, aquaculture, ports and harbours and coastal mining, Municipal Waste Water Management, Solid Waste Management and Agriculture) that you know have been organized in the region or you have attended. Also include the event theme/topics, who organized or delivered the event, the venue and the dates.

Main theme/topics covered:	Type *training course/ workshop*	Organized/ delivered by:	Venue *country*	When
1.				
2.				
3.				
4.				

ii) List existing organizations/colleges/universities in your country that currently offer regular training or education in topics related to tourism, aquaculture, ports and harbours and coastal mining:

Organization/Institution	Faculty/Department/Section	What topics/subjects
1.		
2.		
3.		
4.		
5.		

iii) What, in your view, were/are greatest strengths of the past/existing short/long-term training courses in the region that you have been attending: (Tick where relevant).

	Yes	**No**
Based on the identified needs		
Appropriateness of the target groups		
Quality of trainers		
Applicability of the knowledge imparted		
Post-course activities		
General comments		

iv) Please identify training topics that are not currently being taught which you consider to be important

4. Assessment of preferred mode of delivery

i) What is the generally preferred mode of training used by your organisation for training of its staff (Tick where relevant).

Formal certifications (diplomas, degrees in academic and professional subjects)	
Short courses on general management subjects	
Short courses on specialised technical subjects	
Short courses divided into modules and taught at different sites and times	
In-service (on-the-job) staff training in the organization's facilities	
Staff exchange/study tours	
Distance learning	
Other, specify	

ii) Based on the training needs identified in the section 2 above, what is your recommended preferred mode of training courses delivery: (Tick where relevant).

Formal certifications (diplomas, degrees in academic and professional subjects)	
Short courses on general management subjects	
Short courses on specialised technical subjects	
Short courses divided into modules and taught at different sites and times	
In-service (on-the-job) staff training in the organization's facilities	
Skills (staff) exchange	
Study tours to demonstration sites	
Distance learning	
Other, specify	

iii) What factors influence sending staff for training? (Tick where relevant).

Staff shortages	
Timing of courses	
Work loads	
Relevance of courses	
Travel restrictions	
Cost of travel/Budgetary constraints	
Inadequate notification period	
Quality of the training	
Others, specify	

iv) Briefly explain the rationale of your recommendations

_____

_____

v) What is the maximum time period that your organization would allow you to be absent from work to attend a training course

_____

_____

_____

5. Do you have any comments or suggestions you would like to add?

_____

_____

_____

Thank you for your contribution.
Please return this questionnaire by email to juku@kmfri.co.ke (cc **julius@wiomsa.org)** ***by 20th December2005.***